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1 Getting Started

In this chapter, we'll tell you what you need to run RealTime, how to set up your MIDI equipment, and how to make a working copy of your RealTime disk.

We assume that you know how to use your Atari, that you're familiar with basic Atari terminology, that you know how to open, close and move windows, that you can use drop-down menus, and that you have some skill with mouse techniques, such as clicking, double-clicking and dragging. If you're already an Atari user, you'll have no problem using RealTime.

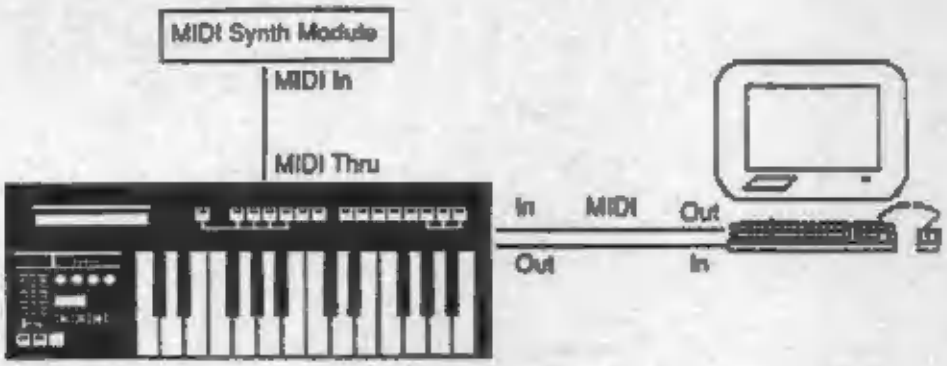
What You'll Need

To use RealTime, you'll need an Atari ST series computer, a MIDI sound generator, and an audio system. We recommend using a MIDI controller, such as a MIDI keyboard, but it is possible to use RealTime without one.

Setting Up Your MIDI System

Connect the MIDI Out from your Atari's MIDI interface to the MIDI In of your MIDI synthesizer. Then connect the MIDI Out from your MIDI controller to your Atari's MIDI In.

If you have more than one synthesizer, you can connect them in a chain using their MIDI Thru connections.



Making a Working Copy of RealTime

The RealTime Master Disk is copy-protected. Take good care of it. To avoid accidental damage to your Master Disk, we recommend that you make a working copy of the Master Disk and use the working copy to run RealTime.

To make a working copy, format a blank disk and, using normal desktop copy operations, copy all of the files from your Master Disk onto it. If you're using a hard disk, copy the files onto the hard disk. **Important:** Do not use a copy program to make the working copy.

Install RealTime on the desktop as an application so that double-clicking on any of its files will run the program. To do this, select the RealTime.PRG icon while on the Atari desktop. Then choose **Install Application** from the Options menu. Install RealTime as a GEM application with a Document Type of RT7. Remember to save the desktop on your startup disk so that you won't have to repeat this process every time you boot your Atari.

Run RealTime from your working copy. Insert your Master Disk when the program asks you to do so.

Hard Disk Installation

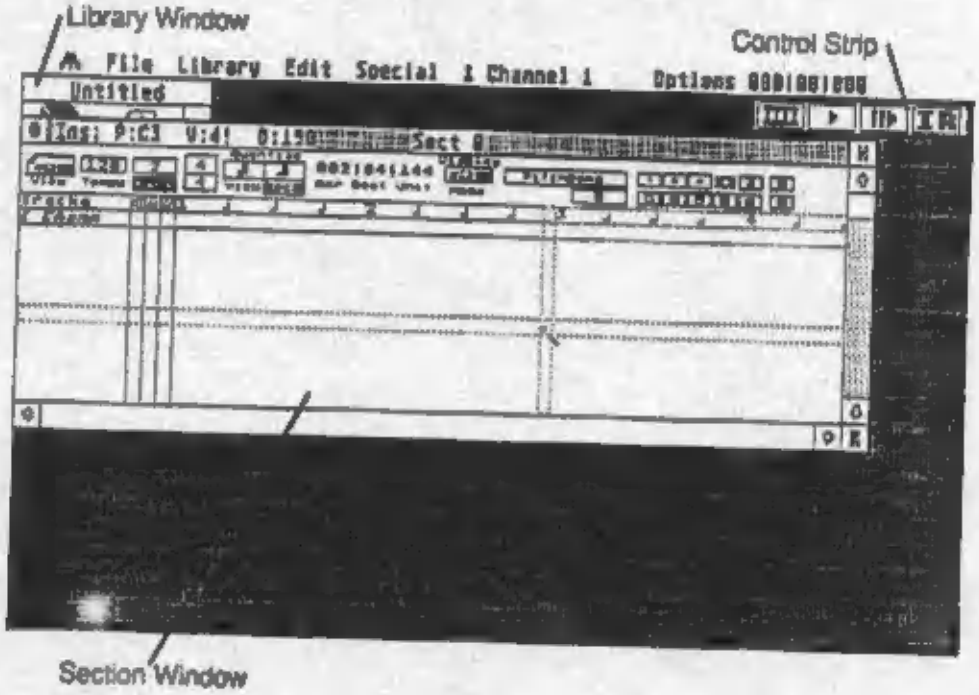
Upon receipt of your User Registration card, which you'll find the pocket of this binder, we'll send you a backup disk which contains a hard disk installation program. The hard disk installation program will allow you to run RealTime from your hard disk without having to insert your Master Disk.

2 A RealTime Tour

In this chapter, we'll familiarize you with RealTime's screen controls and mouse actions. Then we'll give you an overview of RealTime's structure and windows.

Run RealTime by double-clicking on the application icon. A dialog box will appear asking you to name a new Section. Click on the OK button.

The layout of the main screen will look something like this.



The Control Strip is in the upper right corner of the screen. A Section window is in the foreground. The Library window is in the background on the left, labelled Untitled.

RealTime's Screen Controls

RealTime's windows contain a variety of screen controls that we've specially designed to help you make music easily and quickly. They include buttons, Numericals, pop-down menus, and Sliders.

Buttons

A **button** is something you click on to trigger an action. The Control Strip contains four buttons.

Click on them, just to get a feel for it.

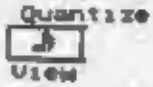
Numericals

A **Numerical** is a box which contains a letter, number, or graphic that can be changed with the mouse to show a greater or lesser value or to step through a series of values.

The Tempo control, next to the View button at the upper left corner of the Section window, is a Numerical. Click on the number with the left mouse button and its value will increase. Click with the right button and its value will decrease.

You can also scroll through a Numerical's values by holding down either mouse button and moving the mouse up (for higher values) or down (for lower values).

To see how a non-number Numerical works, look at the Quantize View Numerical, to the right of the Tempo Numerical. Click on the note icon with the left mouse button to increase the value of the note. Click on the note icon with the right mouse button to decrease the value of the note. Or use the scrolling technique described above.



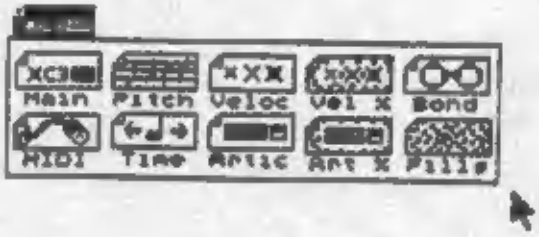
Pop-Down Menus

Menus should be old news to anyone who is already familiar with their Atari. Pop-down menus are pretty much like normal menus, but they can appear anywhere on the screen and they can contain icons or text.

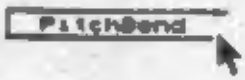
Open a pop-down menu by clicking on its title button. The menu will "pop down" to display its options. When you select an option, the pop-down menu will disappear. If you want a pop-down menu to disappear without selecting an option, click outside of the menu.

The View pop-down menu is an example of a pop-down menu with icon options. It's at the left of the Section window in the Section Bar. Click on the View button to open it.

Then click outside it to close it.



The Controls pop-down menu is an example of a pop-down menu with text options. It's at the right of the Section window in the Section Bar. Click on it to open it.



Then click outside it to close it.

Sliders

A Slider is a screen object which you drag to set a value.

Here's an example. Open the View pop-down menu. Then select the Artic icon by clicking on it. You'll see this:

Articulation symbol sliders

Each of the five articulation symbols appears at a position which indicates its current value (for the moment, because this is a quick tour, we won't worry about what the value means). Click on an articulation symbol and drag it to the left (to decrease its value) or the right (to increase its value). The selected articulation symbol's current value is indicated by the number in the column under **Val**.

Mouse Actions

As an Atari owner, you're familiar with clicking, double-clicking, and dragging. These mouse actions are called for in using RealTime.

There are, however, some modified mouse actions called for in using RealTime. These modified mouse actions call for holding down the Shift key, or the Alt key, or the Control key, while performing an otherwise ordinary mouse action. We refer to these modified mouse actions as **Shift-click**, **Shift-drag**, **Alt-drag**, **Control-drag**, etc.

RealTime's Structure

RealTime's structure is simple. You create Sections and link them into Songs.

A Section is, simply put, a section of music, containing up to 256 tracks and up to 999 bars. Sections are created in the Section window.

A Song is an entire composition, or, in other words, a chain of Sections. To create a Song, you open a Song window by choosing New Song... from the Library menu, then drag Sections from the Library window into the Song window. A Song can contain any number of Sections, limited only by the size of your Atari's memory.

A Song can also contain other Songs. A Song can also contain a MIDI File, to be played simultaneously with the Song.

Whenever you create a Section or Song, it's automatically stored in the Library window. The Library window contains a list of all Sections and Songs created in a RealTime workspace. The Library window can contain any number of Sections or Songs, limited only by the size of your Atari's memory.

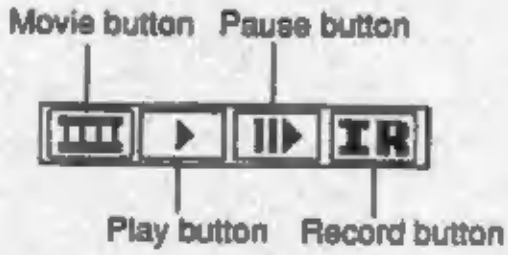
In summary, there are three important windows in RealTime:

- The Section window, where you create your music.
- The Song window, where you link Sections and Songs into Songs to create entire compositions.
- The Library window, where you store any number of Sections and Songs.

There's also the Control Strip, of course, which gives you basic controls for playing, recording, pausing, and capturing your playback to save it as a MIDI File.

The Control Strip

The Control Strip contains a Play button, a Pause button, a Record button, and a Movie button.



The Play button starts and stops your music. Click it to start. Click on it again to stop.

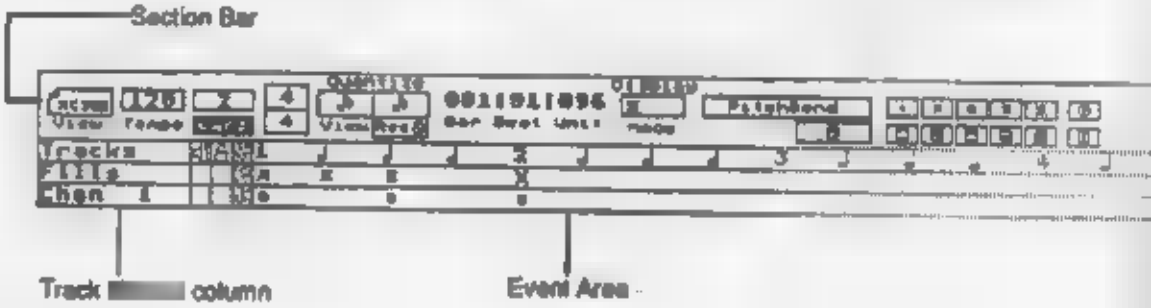
The Pause button will stop your music, then start it again from where you left off.

The Record button recording.

The Movie button captures a RealTime playback which can then be saved as a MIDI File.

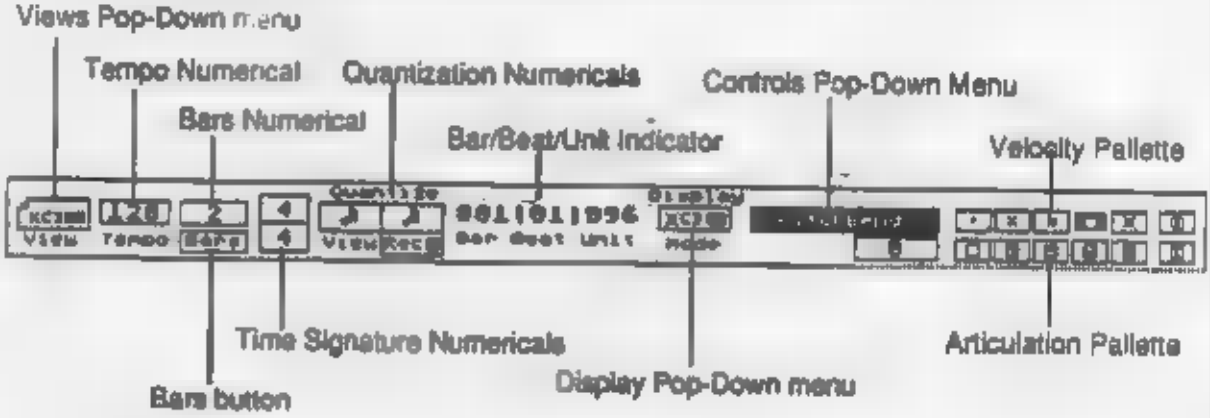
The Section Window

The Section window consists of a Section Bar, a Track Names column, and an event area.



The Section Bar

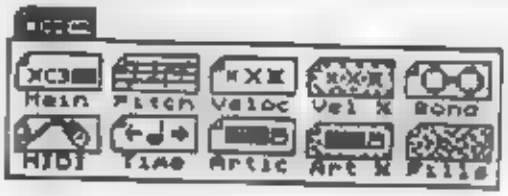
The Section Bar controls which affect entire Section.



The View Pop-Down Menu

RealTime allows you to choose the type of information that you'll see represented [redacted] the event area of [redacted] Section window.

Open the View pop-down menu and select the different Views [redacted] we mention them. We'll describe their functions in [redacted] we discuss their uses in other chapters.



The default view is called [redacted] **Main View.** [redacted] displays all musical events except for continuous control information.

The **Pitch View** displays transposition, [redacted] density, and note-ordering parameters.

The **Veloc View** lets you define or change velocity values. The **Vel % View** lets you set the probabilities with which the different velocity values will occur.

The **Bond View** shows Track Bondage settings, which let you relate one track to another.

The **MIDI View** lets you change a track's MIDI channel, program (patch) number, and basic volume.

The **Time View** lets you set [redacted] delay time and Time Deviation value for each track.

The **Artic** [redacted]**ew** lets you define the values of preset articulations. The **Art % View** lets you [redacted] the probability with which a preset articulation will occur when articulations are [redacted] to occur randomly.

The **Fills View** lets you control many aspects of automatic Fill generation.

The Tempo Numerical

The Tempo Numerical allows you to set [redacted] Section's tempo.

The Bars Numerical and Button

The Bars Numerical lets you determine how many bars [redacted] Section will contain.

The Bar button, when enabled, causes [redacted] Section to automatically restart all tracks at the end of the number of bars specified in the Bars Numerical. The Bars button should always [redacted] enabled when you're recording through MIDI.

The Time Signature Numericals

The Time Signature contains two Numericals. The numerator sets the number of beats per bar, from one to thirty-two. The denominator sets the note value for each beat: 1 = a whole note, 2 = a half note, 4 = a quarter note, and so on.

The Quantize Numericals

The View Quantize Numerical allows for setting a quantization value for viewing and graphically editing information which appears in the event area.

The Rec Numerical sets a quantization value for recording notes via MIDI.

Both Numericals can be set at any value between one-768th of a whole note and a half note.

The Bar/Beat/Unit Indicator

The Bar | Beat | Unit indicator shows the current location of the mouse within the Edit grid.

A word of explanation. A Unit is a Tick, one-192nd of a quarter note. The Unit indicator changes in Tick increments equal to the value of the View Quantize Numerical. If the View Quantize Numerical is set to quarter notes, for example, the Unit indicator will change in increments of 192, because there are 192 Ticks in a quarter note. If the View Quantize Numerical is set to 32nd notes, the Unit indicator will change in increments of 24, because there are 24 Ticks in a 32nd note.

The Display Pop-Down Menu

The Display pop-down menu allows you to choose which details you're seeing as you look at the events in each track. The display of the notes will be changed in all tracks whose names are selected in the Track Names column.

It is also true that when you select a track, the Display button will automatically change to reflect the type of information already in the selected track.

The Controls Pop-Down Menu

This menu allows you to display MIDI control information in the continuous display portion of the event area, as well as to choose what specific type of control information is shown.

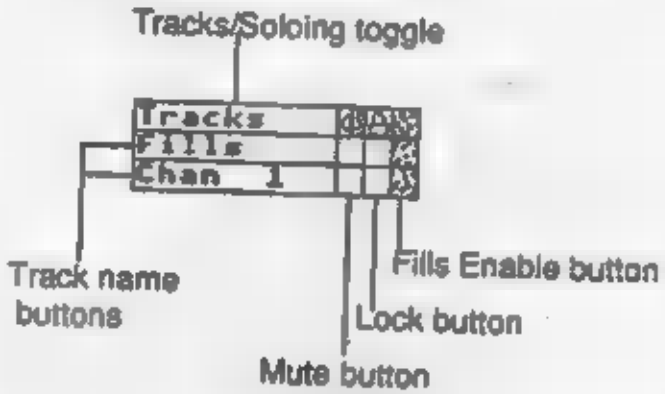
The Velocity and Articulation Palettes

The Velocity Palette and the Articulation Palette each contain five preset velocity (strike) levels and five preset articulation values. You can choose from these palettes when you're painting events into a track.

There are also icons, to the right of the palettes, which represent the automatic, random choice of one of the five preset values.

The Track Names Column

The Track Names column contains the Tracks/Soloing toggle, track buttons, a Mute button, a Lock button, and a Fills-Enable button.



The Tracks/Soloing toggle lets you solo selected tracks. Track names appear in the spaces under the Tracks/Soloing toggle. Clicking on a track name selects a track. The Mute button lets you silence a track during playback. The Lock button prevents the event information in a track from being altered in any way. The Fill-Enable button lets RealTime play a track's automatically-generated Fills.

To select *all* tracks, Shift-click on the Tracks/Soloing toggle.

To mute all tracks in a Section, click with the left mouse button on the Mute column icon. To un-mute all muted tracks in a Section, click with the right mouse button on the Mute column icon.

To lock all tracks in a Section, click with the left mouse button on the Lock column icon. To un-lock all locked tracks in a Section, click with the right mouse button on the Lock column icon.

3 Customize To Your MIDI Setup

In this chapter, we'll begin to explain RealTime's Devices feature.

The Devices feature remembers the names of the sounds in your drum machines or samplers, and the pitches associated with them. Each sound name and collection of pitches associated with it is called a Track Definition. A Device is a collection of Track Definitions.

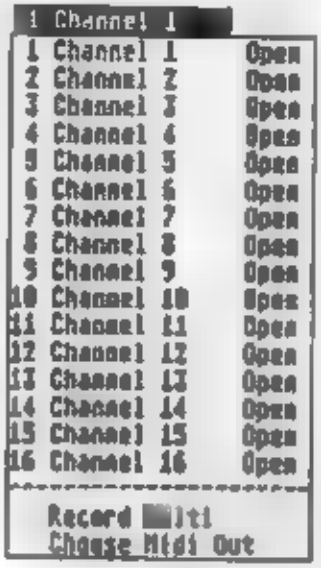
We're discussing the Devices feature before we discuss normal recording techniques, because Devices have powerful organizational features that will help you throughout a session. For one thing, the Devices feature allows you to refer to your MIDI devices by name, rather than channel number (as in ordinary sequencers). For another thing, it allows you to refer to sounds on your drum machine or sampler by name rather than MIDI note numbers. This means that tracks are ready, defined, and waiting for you as you boot RealTime for a session.

Further, when you record through a MIDI channel that's associated with a drum-machine Device, the Devices feature will automatically open separate tracks for each sound with its associated name displayed.

The Devices feature also lets you store collections of notes and chords, which you can use in building up synth tracks. But this is an advanced use of the Devices feature, and we'll describe it in Chapter 7.

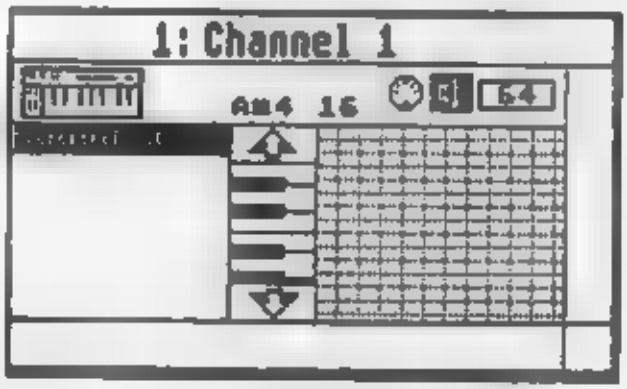
Name your MIDI Channels

Open the Channel menu. Notice that it's a bit different from other Atari menus in that it has two selections per line: the number/name of a MIDI channel, and the Open command to the right.



To name your MIDI channels:

1. Select the Open command next to the MIDI channel that corresponds to the receive channel of one of your synthesizers. The name of the MIDI chann will be displayed in the Menu Bar and a Device window will appear.



2. Click *with the right mouse button* on the keyboard icon in the upper left hand section of the Device window. Or select Edit Name... from the Library menu.

3. A standard dialog box will appear. Press the Esc key to clear the text. Then type in whatever name you like, for example "TR-505" or "Kurzweil."

4. Click on Synth or Drums. Choose Drums if you're naming a MIDI instrument whose sounds are assigned to specific notes, such as a drum machine or sampler. Choose Synth if you're naming a synthesizer. After you click, the dialog box will close. If you chose Drums, notice that the keyboard icon has changed to a drum-kit icon.

5. Close the current Device window and repeat Steps 1-to-4 for each of the MIDI channels [redacted] which you have a sound module.

Drum Machine Devices

We're going to show how to set up a Device for your drum machine's sounds. You can do this with or without MIDI.

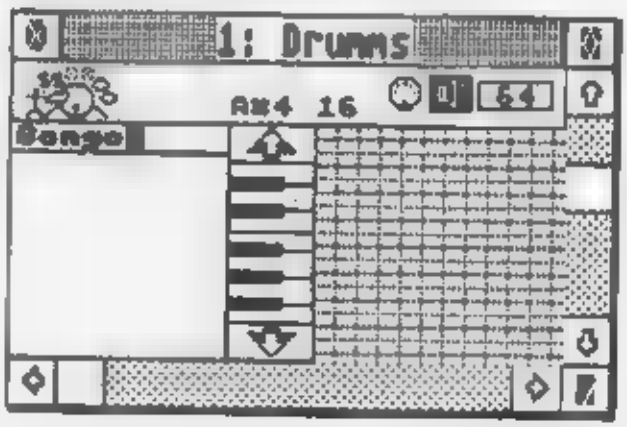
Setting Up A Drum Machine Device...

...With MIDI

[redacted] you're using a MIDI keyboard, or if your drum machine generates MIDI, follow these steps:

1. Choose the Open command next to the MIDI channel that corresponds to the receive channel of one of your drum machines. The name of the MIDI channel will be displayed in the Menu Bar and a Device window will appear, with a Track Definition ready for input.

2. Type in the name of the first sound on your drum machine, for example "Bongo." Notice that [redacted] name becomes active.



3. Play the pitch that corresponds to the sound you've just named. If your drum machine generates MIDI, and its MIDI Out is connected to your Atari's MIDI In, you can play the sound on your drum machine pad. If your drum machine doesn't generate MIDI, play the pitch on your MIDI keyboard. You can fumble around as much as you like in finding the correct pitch, because RealTime will remember only the last pitch you played.

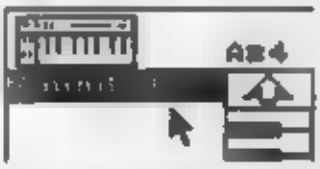
4. When you've found the correct pitch, press the Return key on your Atari's keyboard. Your pitch will be registered in the Definition Grid and the next Track Definition will appear, ready for input.

5. Repeat Steps 2, 3 and 4 until you've entered names and pitches for all of your drum machine's sounds. Then close the window.

...Without MIDI

If you don't have a [redacted] keyboard, you can enter pitches manually by using the Definition Grid.

1. Select a Track Definition by clicking on the Track Definition's name.



If you want to create a new Track Definition, click beneath the names of existing Track Definitions. Then type in the new Track Definition's name. Press the Enter key on your Atari's keyboard when you're done.

2. With the name of the Track Definition still selected, click in the first Step in the Definition Grid, in the box across from the note on the keyboard that will trigger the sound you want. If you're not sure of the pitch, find the pitch by clicking on the keyboard to the left of the Definition Grid. You should be hearing your sounds as you click.

If you're not sure how to use the Definition Grid, see "Using The Device Window" below.

3. Repeat Steps 1 and 2 until you've entered all of your drum machine's Track Definitions.

Saving a Device List

After you've defined your Devices, you'll want to save your Device List so that it becomes part of RealTime's startup default. A Device List is the Device setup for all sixteen MIDI channels.

To save a Device List, choose **Save Device List As...** from the File menu. A standard dialog box will appear.

You'll probably want to save your Device List as **DEVICES.RTL**, so that every time RealTime starts up, it will load in that Device List as its default set of Devices. Click on the OK button and RealTime will automatically save the file as Devices.RTL.

But suppose, for example, that you're using RealTime in a friend's studio with a different MIDI setup. You might want to create a Device List for that setup. You can save a Device List with any name, for example "SamSound.RTL."

When you want a particular Device List to load with RealTime's startup, rename it DEVICES.RTL in the desktop before you run RealTime. But don't forget to rename the previous Devices.RTL to something else, for example "Another.RTL".

Click on the OK button after you've specified a name.

Saving and Loading a Single Device

If you want to change Device setups to suit different configurations of your MIDI setup, you may want to create a collection of Device files that you can later recall independently.

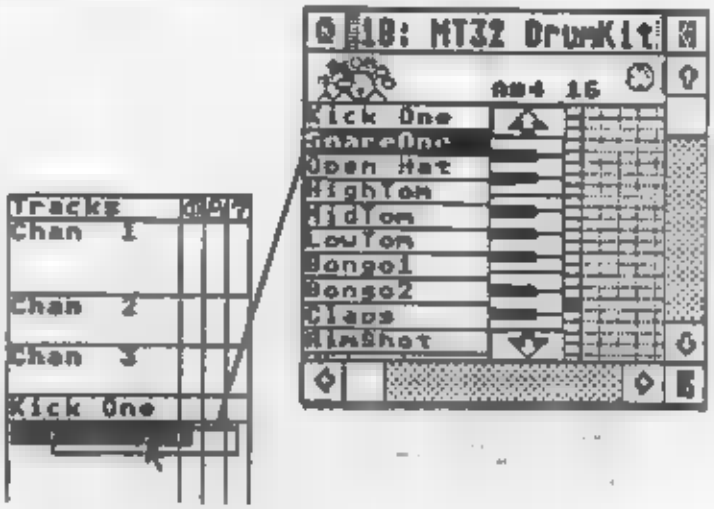
To save a single Device, choose **Save Device** from the File menu. The Device window must be active.

To load a single Device from disk, open the Device window for the channel on which you want the Device to appear. With the Device window active, choose Load Device from the File menu. You'll then see your Device appear in the Device window with its Track Definitions ready to be used.

Using Drum Machine Track Definitions

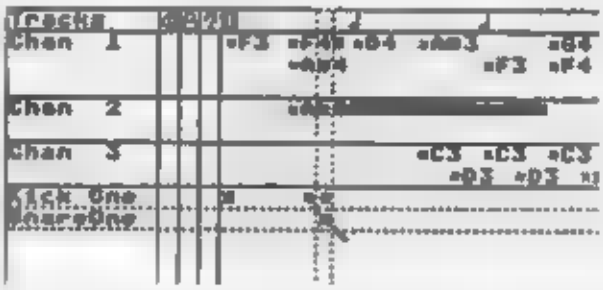
Once you've entered all of your Track Definitions, you'll want to put the Track Definitions into tracks in a Section window.

First, with the Device window active, drag a Track Definition from the Device window into the Track Names column in the Section window. Drag the Track Definition to a position under the existing track



You can drag *all* Track Definitions from a Device window into a Section window by dragging the Device icon into the Track Names column.

When you've got your Track Definitions in place, the Section window is ready for painting. Close the Device window, start the music and, using the Striker, paint notes into the track.

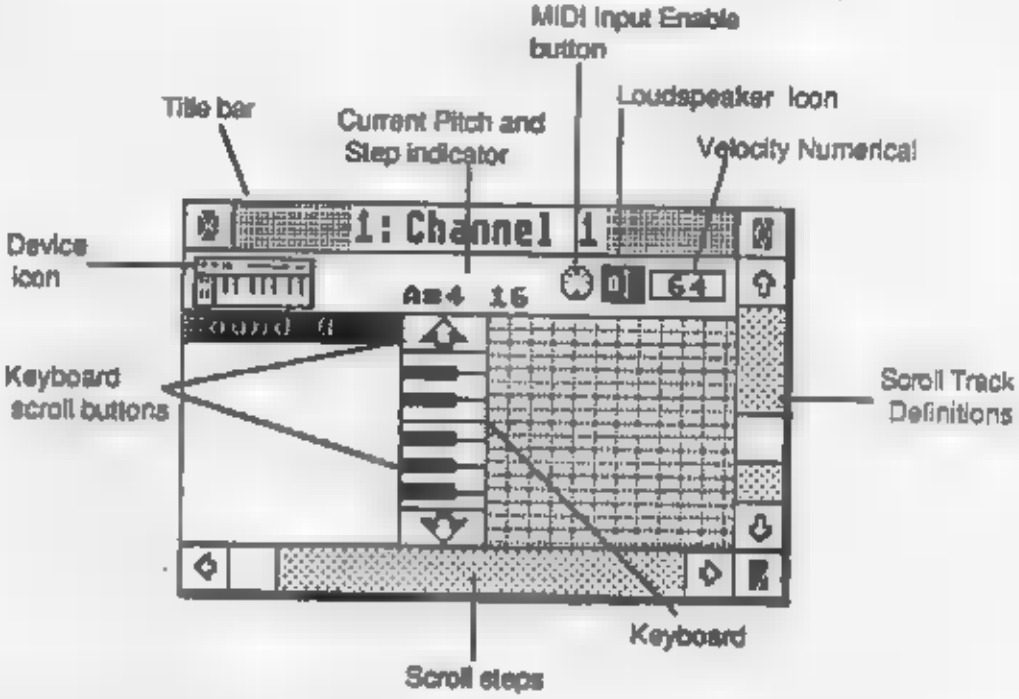


As the Beat Bar marker steps by, you'll hear the notes played back. We'll have a lot more to say about painting in the next chapter.

Using The Device Window

Open the appropriate Device window and select the Track Definition you want to edit.

The Device window is set up like this...



Move the window by dragging the title bar.

To rename your Device, click on the Device Icon *with the right mouse button.*

To toggle the selected/deselected state of all Track Definitions, Shift-click the Device icon.

To enter multiple pitches into a Track Definition through MIDI, highlight the MIDI Input Enable button. This has important applications for synth Track Definitions, which we'll describe in detail in Chapter 7. To highlight the MIDI Input Enable button, click on it. To unhighlight it, click it again.

When the Loudspeaker Icon is highlighted, pitches are echoed through to your MIDI system as you enter them in the grid. To highlight the Loudspeaker Icon, click it. To unhighlight it, click it again.

To set the velocity values with which pitches are echoed, the value in the Velocity Numerical.

The Track Definition column is a list of the names of your Track Definitions. Scroll through the [redacted] of your Track Definitions using the vertical scroll bar.

To change the name of a Track Definition, click on its name *with the right mouse button*, then press the Esc key on your Atari's keyboard to clear existing text, then type in a new name, then press the Return key.

Clicking on the keyboard lets you hear pitches without entering them in the grid.

The Definition Grid represents pitches vertically, and successive collections of pitches [redacted] horizontally arranged Steps. You [redacted] have up to 128 Steps, of 128 pitches each, in a Track Definition. Note that [redacted] position of the mouse in [redacted] Definition Grid is indicated by the Pitch and Step indicators.

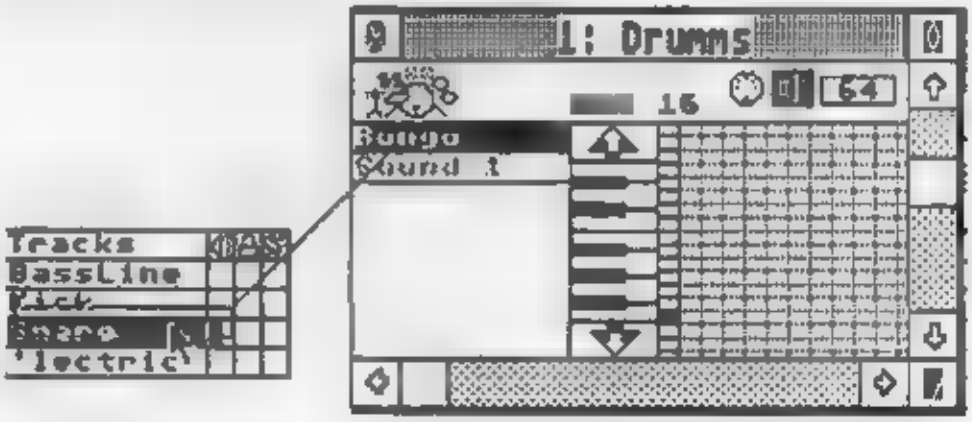
To scroll the grid up and down by octaves, click on the Keyboard Scroll buttons.

To scroll through Steps, click in the horizontal scroll bar. To scroll one Step, click on [redacted] arrow at the end of the scroll bar.

To enlarge the Device window so that you see a greater range of Steps and Pitches, drag the Size handle.

Changing Track Definitions

To replace one Track Definition for another in the Section window, both the Section window and the Device window containing the new Track Definition must be open, and the Device window must be active. Drag the new Track Definition from the Device window over the old track name in the Section window.



To replace one Track Definition with another throughout your entire composition, drag the new Track Definition over the the old one *in the Device window*. The changes will be reflected in all of the Section windows. If the new and old Track Definitions are in different Device windows, open both Device windows and drag the new Track Definition over the old.

To change the channel for an entire Device, open the Device windows for both the current *and* destination MIDI channels. Then drag the Device icon of the current channel into the window of the destination Device. The MIDI channels will be swapped.

4 Basic Recording and Editing

RealTime provides several methods and options for recording.

- You can record from your MIDI controller.
- You can Paint Record, by clicking the mouse in a Section window.
- You can Point Record, by pointing the mouse where you want notes to appear and playing the notes on your MIDI keyboard.

In this chapter, we'll discuss most of what you need [redacted] know about recording. We'll also discuss some basic editing techniques.

MIDI Recording

When RealTime opens, [redacted] track, called 1 Channel, is open in the Section window. It's initially [redacted] to MIDI channel 1.

Choose a Device or a [redacted] Channel

In the Channel menu, choose the Device name, or MIDI channel number if you haven't yet named your channels, to which you want to record. Notice that the title of the Channel menu becomes the name of the channel you selected.

Enable and Disable Echo

Play a few notes on your MIDI keyboard.

It's saying the obvious, but you heard the notes you played. You heard them because what you played was echoed through the chosen channel to whatever MIDI device was listening to that channel.

To disable echoing, open the Options menu and click on Echo MIDI Thru . The checkmark will disappear.

To re-enable echoing, choose Echo MIDI Thru again from the Options menu. The checkmark will reappear.

Set The Bars Numerical for Section Looping

Set the Bars Numerical, left of center in the Section Bar, to the number of bars you want the Section to contain. In other words, set the Bars Numerical to the length, in bars, of your recording.

If you're not sure how many bars long your recording will be, set the Bars Numerical to a sufficiently large number. Bar numbers can go as high as 999. Then, after you finish recording, you can set the Bars Numerical to a length that corresponds to your music.

Normally, Sections loop automatically at the end of the number of bars specified in the Bars Numerical. If a Section is four bars long, for example, and you play for eight bars, you'll be recording on top of the first four bars as you record bars five thru eight.

Note: If you change the Bars Numerical while recording or playing back, the Section's looping will change to reflect the new value after the current loop is complete.

RealTime loops Sections so that you can record interactively. Let's say that you know exactly where one chord should go, but you're not sure what else the track should do. Record that one chord and as the Section loops, play in some more.

The Bars button, under the Bars Numerical, enables Section looping, and it can be disabled. But in the context of MIDI recording, don't disable it. Looping can be controlled in a variety of different ways, as we'll discuss later in this chapter and in Chapter 8.

About Insert and Replace Record

Before you click on the Record button, be aware that there are two record modes: Insert Record (IR) and Replace Record (RR).

Insert Record adds what you play or paint to what already exists in a track, allowing you to record a track in multiple passes. Insert Record is automatically selected as the recording mode when you choose a synthesizer Device from the Channels menu.

Replace Record replaces any existing events when you record over them. Replace Record is automatically selected as the recording mode when you choose a drum-machine Device from the Channels menu.

The default linking of Insert Record to synthesizer Devices and Replace Record to drum-machine devices is based on our assumptions of normal use. We assumed that you would want to play chords in a synth track and that you would not want to play chords in a drum track. But you can change between the record modes easily.

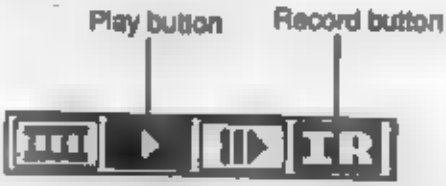
To change between the two record modes, click on the Record button *with the right mouse button.*

Then click on either IR or RR with the left mouse button.

Record

Select the Record button with the left mouse button. Or press your Atari's Tab key.

Then click on the Play button. Or press your Atari's Spacebar.



The Timers menu title will read Waiting. If the volume isn't up on your Atari monitor, turn it up so that you hear a metronome. RealTime is waiting for you play the first note before it starts recording.

Play something on your keyboard. The Counter will begin to count. Notice that the tracks loop at the number of bars you've set in the Bars Numerical.

When you want to stop, click again on the Play button.

To start a playback, do either of the following. Deselect the Record button, then click on the Play button. Or click on the Play button — twice.

Record Waiting

If Record Waiting is enabled in the Options menu, the recording will start only when you start playing on your MIDI keyboard. While waiting, RealTime will display Waiting as the title of the Timer menu.

To enable Record Waiting, choose **Record Waiting** from the Options menu. A checkmark will appear.

To disable Record Waiting, choose it again. The checkmark will disappear.

Note: If the Record button in the Control Strip is enabled when you click on the Play button, and nothing happens — chances are that Record Waiting is enabled. If you just want to play back what you've recorded, without disabling the Record button, start the playback by clicking on the Play button a second time, or press the Spacebar.

The Metronome

The Metronome can be an important aid in MIDI recording.

To enable or disable the Metronome, choose **Metronome** from the Timer menu. Or type Control-K. A checkmark will appear if it's enabled.

If the Metronome is enabled and you don't hear anything, turn up the volume of your Atari's monitor.

Scrolling the Screen

If what you've recorded extends beyond the edge of the Section window, you can set the screen to scroll.

To enable scrolling, choose **Scrolling** from the Timer menu. To disable scrolling, choose **Scrolling** again from the Timer menu. A checkmark will appear when scrolling is enabled.

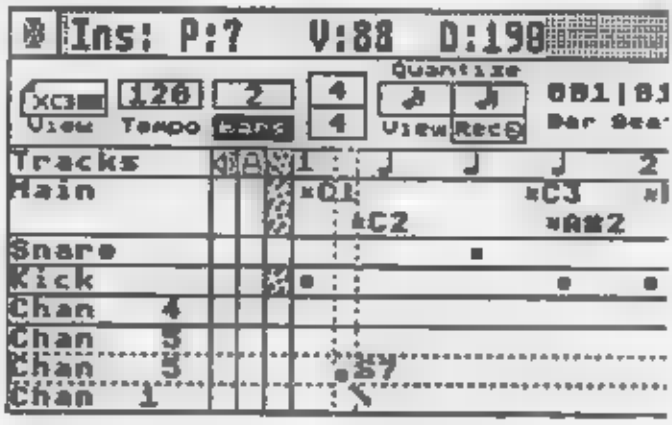
Note that the Section window will not reset to the beginning of the Section if the cursor is in the Section window's event area.

Note Symbols

As you record, symbols will appear in the track.

There are strike symbols, which indicate the points at which notes begin. The strike symbols appear in different shapes. Each shape represents a different MIDI velocity.

There are pitch displays. The pitch displays are shown as text indicating MIDI note numbers. C3, for example, represents middle C. C4 represents C an octave higher than middle C. S pitches represent a special technique, which we'll discuss in Chapter 7.



There are duration displays, which show the actual durations of the notes as gray bars.

A chord using the pitch and duration display would look like this...

There might be articulation displays, which are relative values, in that they represent the percentage of the time between the beginning of one note and the beginning of the next.

The question is: How do you want to view the events in a track? Do you want to see only the beginning of each note with its approximate velocity, or do you want to see pitches and durations as well?

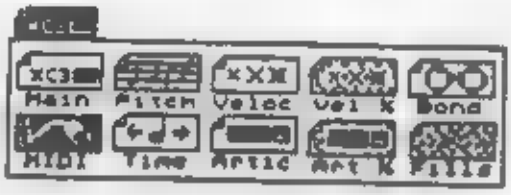
To choose a display, click on the name, in the Track Names column, of the track whose display you want to change.

Then open the Display pop-down menu and choose one of the options.

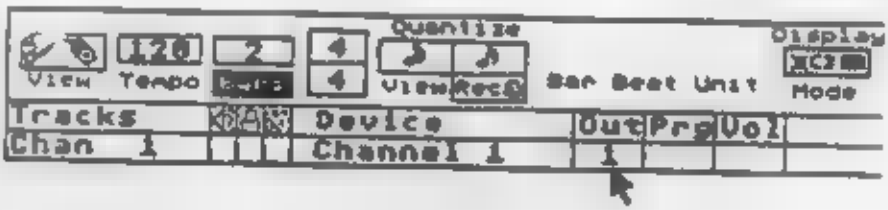
Note: RealTime defaults ■ displaying a Strike Symbol, pitch, and duration for a synth track (a track that sends on a MIDI channel set up as a Synth Device) and only a Strike Symbol for a drum track (a track that sends on a MIDI channel set up as a Drum Device). This is because drum tracks typically use only one pitch and drum sounds are of fixed durations.

Change ■ Track's Channel

Once you've recorded a track you may want to change the channel number of the track to send it to a different device. Open the View pop-down menu, and choose the MIDI View.



Then change the Out Numerical to the number of the channel to which you want to record.



Locking Tracks

Let's assume that you've recorded on one track and now you want to record into another track, but on the same channel. Click on the Lock button, which will lock the track you've just recorded.

Then start to play again. Another track will open, playing to the same MIDI channel. You'll find this a handy feature, especially in conjunction with track looping. If you want to build up a recording in successive passes, you can record each pass on a separate track, so that each pass is independent and easily accessible for editing. Don't worry too much about saving tracks — you've got 256 tracks to play with.

Note that the Lock button prevent any recording, editing, or accidental alteration of a track.

Open Additional Tracks

To record into another track on another MIDI channel, select a new channel in the Channel menu and start to play. A new track will automatically open, displaying what you've recorded.

To open a new, empty track, click below the last track in the Tracks Name column. A new track will open, set to the MIDI channel selected in the Channel menu.

Record Into Several Tracks At Once

Suppose you have someone playing keyboards, someone on a MIDI drum kit, and someone else on a MIDI wind/horn/guitar/armchair controller, and you want to capture everyone's performance together.

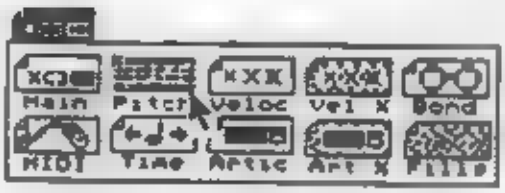
To record into a number of tracks set to different MIDI channels, choose **Record Multi** from the bottom of the Channel menu. Then play your controllers.

Any MIDI information received by RealTime will be assigned to the MIDI channel on which it received. RealTime won't rechannelize the notes.

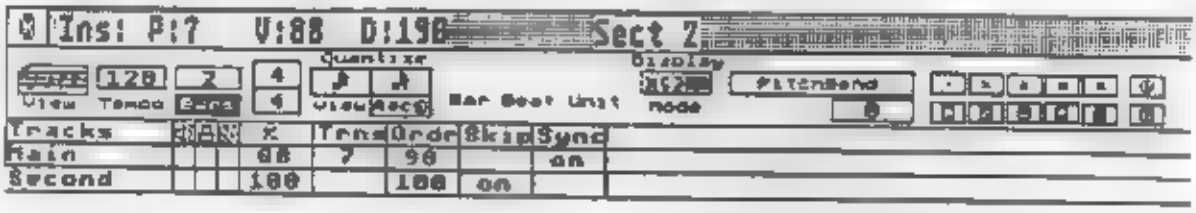
Transposition

The Trns Numerical transposes the original notes that are painted on a track as they're played back. It doesn't permanently change your pitches, just the key in which they're played.

To transpose the pitches of a track during playback, choose Pitch from the View pop-down menu.



The Pitch View of the Section window will appear.



Set the Trns Numerical to the number of half steps you wish to transpose (+ is up, - is down).

Track Shift

Track Shift allows you to move a track forward or back in reference to another track or other tracks, thereby creating digital delay effects.

To shift the start time of an entire track, use the Track Shift Numerical. The unit represented in this Numerical is 1/768th note, or one Tick.

Name a Track

In the Tracks column, click on the name of a track *with the right mouse button.*

Then press the Esc key on your Atari's keyboard to clear the current name. Then type in a new name for that track. All normal text functions are supported, including backspace, upper- and lowercase letters, and the arrow keys. When you've named the track, press the Return key on your Atari's keyboard.

Filtering and Quantizing While Recording

The Record Filter

The Record Filter tells RealTime which MIDI messages to ignore while recording.

To open the Record Filter, choose Filter from the Options menu. The following dialog will appear.

To filter out a range of notes, select the Notes button. Change the Lower and Upper Numericals to specify lowest note of the range and the highest note of the range, and whether the filtering occur inside (In) or outside (Out) of the range. If you do not select either In or Out, then all notes will be filtered.

To filter out aftertouch, polytouch, pitchbend, tempo changes, and program changes, simply enable the button your choice.

To filter out MIDI controls, enable the Controls button. To filter out a single MIDI control, choose the number of the control and select the Only button. To filter out all controls except one, choose the number of that control and select the Except button.

In the picture below, for example, the range of below C1 and above D4 filtered out, polytouch and pitchbend are out, control # 10 is filtered out, and tempo changes are filtered out.

Filtering can be useful for thinning out incoming MIDI data. If you're using the Record Multi feature, for example, you might to filter out aftertouch, just avoid MIDI overflow.

About Tempo Changes

Tempo changes are filtered by default. This is prevent you from accidentally creating a Tempo Map.

A Tempo Map is a succession of tempo changes.

Tempo changes *not* recorded through MIDI. They're recorded when you change the Tempo Numerical in the Section window during recording. When the Record Filter is not filtering tempo changes, any change the Tempo Numerical will be recorded into the track you are currently recording, as a continuous control.

Quantization

When Quantize Input is enabled in the Options menu, notes that are recorded will be quantized according to the value of the Quantize Rec Numerical in the Section window.

Change the Quantize Rec Numerical whatever quantization value you want, from half notes to one-768th of a whole

To enable or disable quantization, select **Quantize Input** in the Options menu. A checkmark will appear when it's enabled.

Paint Record and Graphic Editing

Paint Record is a technique for painting notes directly into a Section window with the mouse.

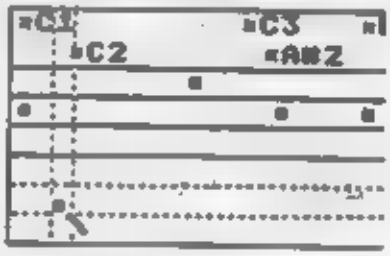
RealTime's graphic editing lets you change notes as you see them on the screen.

Whether painting new information or editing old information, you'll be guided by the Edit grid and using tools from the Section Toolbox.

The Edit Grid

The Edit grid serves two purposes. It lets you locate the exact position of the mouse in the Section window. It also serves as a visual guide and quantization template in graphic editing.

Move the mouse into the event area. The Edit grid follows the mouse as you move it.



To change the quantization value of the Edit grid, change the Quantize View Numerical. When the Quantize View Numerical is set to 16th notes, for example, you can move the mouse in four steps between quarter notes. When the Quantize View Numerical is set to thirty-second notes, for example, as shown below...

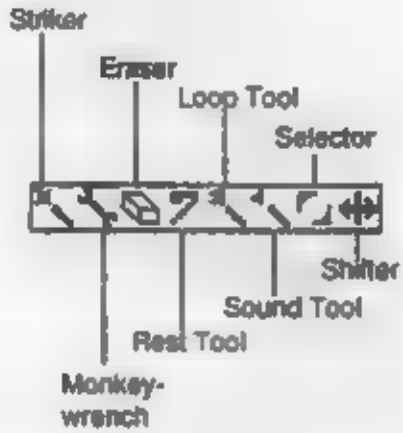
...you can move the mouse in eight steps between quarter notes. You can paint in steps as small as one-768th of a whole note.

The Section Toolbox

The Section Toolbox contains the tools you'll need to paint and graphically edit your music.

To open the Section Toolbox, move the mouse into the event area and click *with the right mouse button.*

The tools are arranged as follows...



Select a tool by moving the cursor over the tool. Then click with the left mouse button. The cursor becomes the tool.

The Striker lets you paint notes. The Loop Tool lets you insert loop points. The Sound Tool lets you insert paint program changes. The Monkeywrench lets you correct mistakes. The Eraser lets you delete events. The Shifter lets you shift events in time. We'll discuss the Rest Tool and the Selector in a later chapter.

Painting Notes

The Striker lets you paint notes with the mouse. You can specify the pitch, velocity, and duration (or articulation) of a note by any of the methods described in the following paragraphs. Then position the Striker at the point you want a note to appear and click the left mouse button. A note will be placed where you clicked.

To specify the pitch of a note, do one of the following:

1. Using your Atari keyboard, type a letter corresponding to a pitch and a number corresponding to an octave. C3 would be middle C, for example. Upper-case letters are used for accidentals (g = G-natural, G = G#) — accidentals are always represented as sharps. Access the -1 and -2 MIDI octaves by typing the - (minus) key and then 1 or 2.

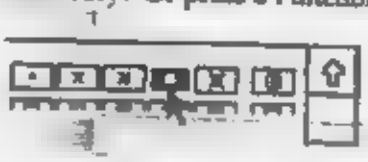
2. Holding down the Shift key on your Atari's keyboard, place a note event and, with the mouse button held down, scroll the pitch up or down.

3. Enable **MIDI Pitch** in the Options menu, then, using your MIDI controller, play the note you want to paint.

However you select a pitch, the Event Information Line, in the left half of the Section Bar, will display the selected pitch, [redacted] to P: .

To specify a velocity, [redacted] any of the following, alone or in combination:

1. Select one of the five preset values from the Velocity Palette to set a basic preset velocity level from which you can vary. Or press a Function key, F1 through F5.



2. Drag up or down as you place the note, to scroll the actual velocity value from its preset value. Or press the up and down arrow keys on your Atari's keyboard, to scroll the actual velocity value from its preset value. Hold down the Shift key to scroll in larger increments.

3. Enable **MIDI Velocity** in the Options menu, then, using your MIDI controller, play any note at the velocity you want to use.

However you specify a velocity value, the Event Information Line, in the left half of the Section Bar, will display the current velocity value, next to V: When the Event Information Line displays a number followed by an explanation point, for example 3!, it's simply displaying the number of the box in the Velocity Palette that represents the preset velocity value.

To specify a duration, rather than an articulation, do one of the following:

1. Drag left or right while you're painting.

2. Use the left and right arrow keys on your Atari's keyboard. Left makes for shorter durations, right for longer. Hold down the Shift key, in addition to the arrow keys, to add (right arrow key) or subtract (left arrow key) increments equal to the current View Quantization value. If, for example, the View Quantization value is 16th notes, then holding down the Shift key with the right arrow key will add a 16th note to the duration of the note you're about to place.

3. Hold down the Shift key and press a Function key, F1 through F10. The Function keys specify the following durations: F1 = 16th note, F2 = dotted 16th note, F3 = 8th note, F4 = dotted 8th note, F5 = quarter note, F6 = dotted quarter note, F7 = half note, F8 = dotted half note, F9 = whole note, and F10 = dotted whole note (what else could we do with the tenth Function key?).

However you specify a duration, the Event Information Line, in the left half of the Section Bar, will display the current duration, next to D: .

To specify an articulation (legato — staccato), rather than a duration, do one of the following:

1. Select one of the preset articulations from the Articulation Palette.

2. Press a Function key, F6 through F10.

However you specify an articulation, the Event Information Line, in the left half of the Section Bar, will display the number of the box in the Articulation Palette that represents the preset articulation, next to D: Articulations are always represented as a number followed by an exclamation point.

Keep Same Notes

To paint multiple copies of the same note to occur at exactly the same time in the same track, enable Keep Same Notes in the Options menu.

When Keep Same Notes is disabled, you can not paint multiple copies of the same note to occur at exactly the same time in the same track.

The new note will replace the already-existing note if there's a difference in velocity or duration between the two.

If the new note and the already-existing note are exactly the same, the new note will erase the already-existing note — which allows for quick correction of errors. If you paint a note in by accident, you can just click on it right away and it's gone!

Inserting Loop Points

The Loop Tool allows you to insert loop points.

Position the Loop Tool wherever you like in a track's event area, and click. A loop point will be placed where you clicked.

The number associated with the loop point represents the probability with which a loop will occur. The probability can be changed with the Atari's up and down arrow keys, or by scrolling the Loop Tool up and down, as in painting velocity with the Striker.

But for now, leave it at 100%. We'll discuss probabilistic looping in Chapter 8.

Inserting Program Changes

The Sound Tool lets you insert program changes.

Position the Sound Tool wherever you like in a track's event area, and click. A program (patch) change will be placed where you clicked.

To change the program number, do one of the following:

1. Hold down the left mouse button and scroll the Sound Tool up and down, as in changing velocity.

2. Type in a program change number, as in specifying a pitch.

3. Use the up and down arrow keys to scroll the program change number.

Correcting Mistakes

The Monkeywrench allows you to edit already-existing events.

Place the tip of the Monkeywrench on the event symbol of the event you want to change.

For [redacted] events, you can graphically edit pitch, velocity, and duration (or articulation) in exactly the same ways that you used the Striker to paint pitch, velocity and duration (or articulation). The only difference is that the note is already there. Refer back to the section on using the Striker. There's one exception: You cannot use your MIDI keyboard to specify pitch and velocity in editing an already existing note.

For loop points, you can change the probability number as you specified it at first. Refer back to the section on the Loop Tool.

For program (patch) changes, you can change the program number as you specified it at first. Refer back to the section on the Sound Tool.

Erasing Mistakes

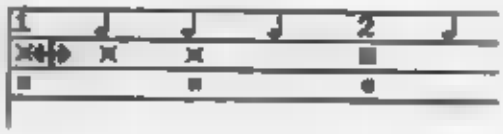
The Eraser allows you to erase any unwanted events. Click on the event symbol of the event you want to erase.

Be careful, though, because you can't undo this operation!

Shifting Events in Time

The Shifter allows you to move any event to another position within a track.

Click on the symbol for the event you want to move, and drag it to its new location.



A word of caution. If you click within a selected Region, the Shifter will move the Region and not a single event. Regional editing is discussed in Chapter 5.

Point Record

Point Record gives you the precision of graphic editing with the immediacy and familiarity of playing on your instrument.

Choose Point Record from the Options menu. Then choose MIDI Pitch from the Options menu (if it's not already selected).

If you want to record velocities at the same time, choose MIDI Velocity from the Options menu. If you don't want to record velocities at the same time, choose them as you'd choose them in Paint Recording.

Durations are specified as they are for Paint Recording.

If Record is enabled, click on the Record button in the Control Strip to disable MIDI Record.

Then point the mouse cursor (don't click it) at the position in a track where you want to insert an event, and play a note or chord on your MIDI keyboard. The note or chord will appear at the specified position.

MIDI Controls

The words control, MIDI control, and controller can be a little confusing because they're used in such overlapping ways.

By way of clarification, a control is a continuous MIDI data stream. Some controls are pitch-bend, aftertouch (sometimes called channel pressure), polyphonic aftertouch (sometimes called key pressure or polytouch), and Tempo Maps.

A MIDI control is a numbered control, including:

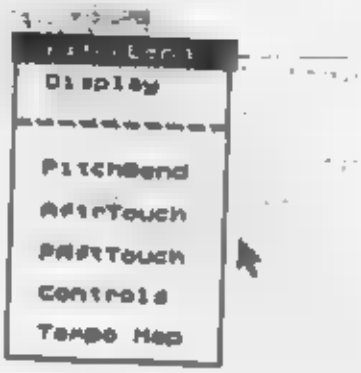
Modulation (#1)
Volume (# 7)
Pan (#10)
Hold/Sustain (#64)

A controller is a device, such as a MIDI keyboard, or a MIDI guitar, or even a MIDI-generating computer program.

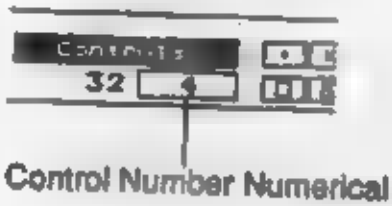
Painting Control Information into a Track

To paint control information into a track, first select the track into which you want to paint control information. Click on the track's name in the Track Names column.

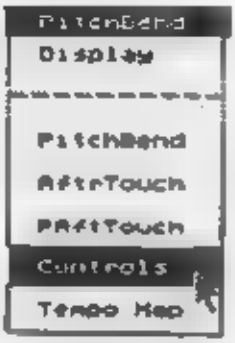
Then, to select a specific control for painting, choose the control name from the Controls pop-down menu.



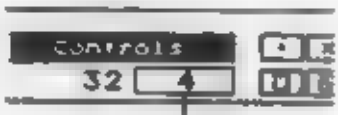
If you've selected polyphonic aftertouch, you'll need to select a specific note to which it will be applied. To choose a specific note for polyphonic aftertouch, change the Control Number Numerical under the Controls pop-down menu.



To select a MIDI control for painting, choose **Controls** from the Controls pop-down menu.



Then, choose the MIDI control number, change the Control Number Numerical under the Controls pop-down menu.



Control Number Numerical

To open the display area for the control information you've selected, open Controls pop-down menu and select **Display**. The selected track's display will open.

Choose the Striker from the Section Toolbox and paint. You'll get the idea when you start to do it. You'll see the specific values you're entering in the Value Indicator underneath the Controls pop-down menu.

If you're working with pitch bend, notice that there's a line across the center of the screen indicating the non-pitch-bend position. Information below that line is pitch bend down, information above is pitch bend up.

To erase control information, drag the Eraser from left to right over any information you want to erase.

To select an adjacent track for painting control information, click in the Section window's vertical scroll bar.

To exit the Control Display, choose **Display** again from the Controls pop-down menu.

Editing the Control Information Already in a Track

Here's the problem. How do you know when a track contains control information?

Here's our solution. Look at the title of the Controls pop-down menu. Even if it's not highlighted, it indicates the control information we're interested in. If the bars of a track that are visible in the Section window contain the type of control information that appears in the title of the Controls pop-down menu, the track's name will appear in bold letters.

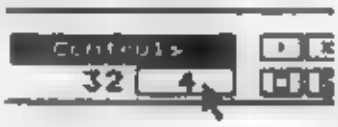
To view the control information in a track, Control-click anywhere in the track's event area. RealTime will then [redacted] display the "first" control present in the track.

Control-click again, and RealTime will find and display the "next" control present in the track.

And so on.

By "first" and "next," we refer to an order of search for control information. RealTime will look first for pitch bend, then aftertouch, then polytouch, then MIDI controls in ascending numeric order, then Tempo Maps.

The title of the Controls pop-down menu, and the Control Number Numerical, will change to reflect the type of control information that's found. If it's polyphonic aftertouch that's found, the pitch will be displayed in the Control Number Numerical. If it's a MIDI control that's found, the number of the MIDI control will be displayed in the Control Number Numerical.



Edit an already existing control as if you were just painting new information. See above for a discussion of painting controls.

To exit the Control Display, choose **Display** again from the Controls pop-down menu.

Copying Tracks

Once you've created Tracks using any of the techniques described in this chapter, you may want to make a copies of a track within the same Section or copy a track into another Section.

To copy a track, Alt-drag the track's name below the existing track names in the Section window to which you want to copy the track.

Regional and Smart Editing

In this chapter, we'll tell you how to edit Regions of music and how to use RealTime's Smart Editing features.

RealTime's editing capabilities are exceptionally powerful. You can, for example, move parts of your music from one location to another. You can also, for example, do things such as turn pitch bend into modulation, scale a selected set of durations to 50% of their original value for bars 2-5 on all notes below G2, thin aftertouch on all tracks, delete all notes above C#4, and, of course, lots more.

You can also quantize note durations and placements.

The techniques used in Regional editing should be familiar to anyone who has used a word processor. It's a two-step method. First, select the Region you want to edit. Then choose the editing operation.

Selecting a Region to Edit

Choose Main View from the View pop-down menu. Then choose the Selector from the Section Toolbox.

A Region is any part of a Section, whether a whole Section, a whole track, a part of a track, or any group of contiguous tracks. It could be a group of notes, of controls, or of anything else.

To select a Region which is onscreen, click in the upper left-hand corner of the Region you want to edit and drag to the lower right-hand corner. You can drag over as many tracks and bars as you like.

If you drag outside the onscreen area, RealTime will scroll the event area accordingly.

You [redacted] also select a moderately large Region by changing the Quantize View Numerical [redacted] reflect a larger note value. This will have the effect of putting a larger number of notes onscreen.

To select an extremely large Region without dragging continuously through the Region, click at the beginning of the Region, then scroll to the end of the Region and Shift-click. The entire Region in between the first click and the Shift-click will be selected.

To select an entire track, double-click in the track's event area.

To select [redacted] Region which extends vertically through all recorded tracks, drag in the Beat Bar from the startpoint of the region to the endpoint. If you drag beyond the edge of the Section window, the Section window will scroll automatically. Alternatively, click [redacted] the beginning of the Region, in the Beat Bar, and Shift-click at the end of the Region, in the Beat Bar. The Region defined by the clicks will be selected.

To select all tracks, double-click in the Beat Bar.

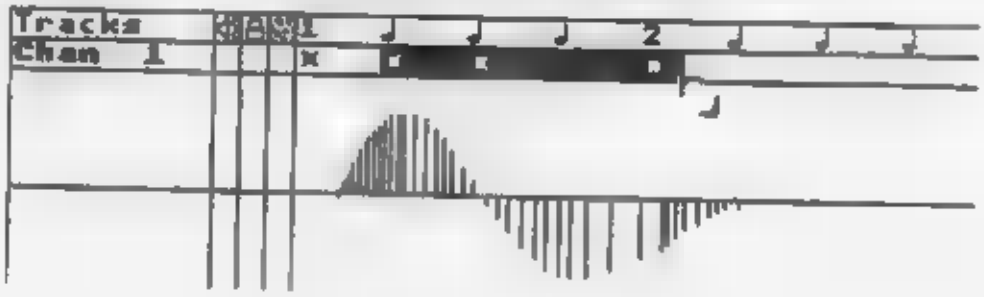
Editing Controls and Notes Separately

Normally, when you select a Region for editing, you're going [redacted] perform edit operations on *all* the events within that Region. What if, however, you want to change all the *visible* events — everything that's normally shown in a track's event area — in a Region, without affecting continuous control information? Or if you want to edit a Region of control information without affecting the visible events? You'll need to separate visible events from control information, and you'll have to work in one track at a time.

To separate visible events from control information in a track, Control-click in that track's eve area, which will open the control display field in the lower part of the Section window.

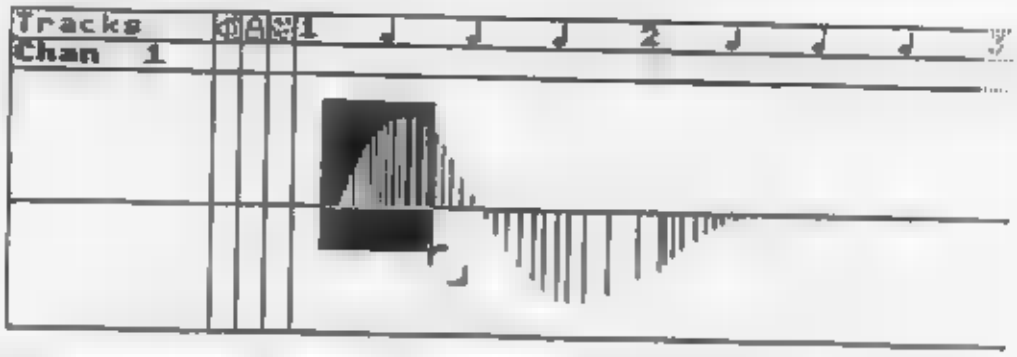
You can also scroll the Section window so that the track you want to isolate becomes the first track under the title bar, then choose Display from the Controls pop-down menu.

Once you've isolated a track and separated visible events from control information, you can select a Region in the track's event area, without affecting any controls, or you can select a Region of control information, without affecting visible events.

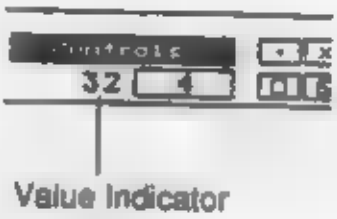


Refer ■ "Painting Control Information Into a Track" in Chapter 4, for a discussion of selecting a specific control to edit.

Once the correct control information is displayed, select a Region by dragging left to right with the Selector. When selecting a Region of control information for normal editing, you're selecting a specific time and *value* range, outside of which control information will not be edited.



Notice that when you're selecting a Region of control information, the Value Indicator, under the Controls pop-down menu, will display the value that corresponds ■ the mouse's current position.



Editing A Region

In addition to the normal cut, copy and paste operations you're likely to find in most programs, there are many unusual and powerful operations here. We direct your attention especially to the many types of paste commands, to shifting and thinning and, of course, to the Smart Editing feature.

Note that any edit operation can be undone. Press the Undo key on your Atari's keyboard immediately after performing the operation. Pressing Undo a second time will redo the operation.

A special note: If you're in the control display view, and if you want ■ perform an edit operation that will affect ■ events within the time defined by your Region, hold down the Shift key while performing the operation. This will override the separateness of control information and visible track events.

Delete

Once you've selected a Region, choose Delete from the Edit menu. Or type Control-E. Or press the Backspace key.

Cut, Copy

Cut deletes the currently selected region and puts it on the Clipboard. Once you've selected a Region, choose Cut from the Edit menu. Or type Control-X.

Copy puts a copy of the currently selected region on the Clipboard. Once you've selected a Region, choose Copy from the Edit menu. Or type Control-C.

Paste

Paste dumps the contents of the Clipboard onto the screen at the beginning of the selected Region. Once you've selected a Region, choose Paste from the Edit menu. Or type Control-V.

If you want to paste a selected Region into a new track, do the following. Choose the Device or channel number of the new track in the Channel menu. Click under the track names in the Track Names column — a new track will open. Select the Region in the new track into which you want to paste. Then execute the appropriate paste command.

Merge Paste adds the contents of the Clipboard to the contents of the currently selected Region. Once you've selected a Region, choose Merge Paste from the Special menu.

Clip Paste takes the contents of the Clipboard and clips it to fit within the currently selected R ion. Once you've a Region, choose Clip Paste from the Special menu.

Fit Paste takes the contents of the Clipboard and scales it to fit within the time frame defined by the currently selected Region. Once you've selected a Region, choose Fit Paste from the Special menu.

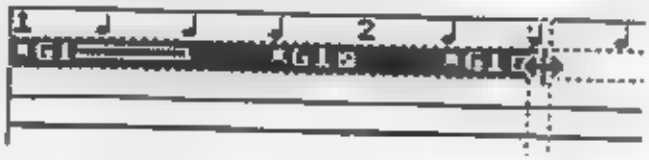
Repeat Paste takes the contents of the Clipboard and repeats it throughout the currently selected Region. Once you've selected a Region, choose Repeat Paste from the Special menu.

Shifting a Region

Shifting a Region allows you to move it backwards or forwards in time.

After selecting the Region to be shifted, choose the Shifter from the Section Toolbox.

Then click in the selected Region and drag it to the left or right.



The data within the Region will be shifted by the amount dragged, in increments determined by the current View Quantization value. Use the Edit grid as a guide while you're shifting. If you want to shift a Region by two 16th notes, for example, move the Edit grid two 16th notes.

To change temporarily from the Shifter [redacted] the Selector, hold down the Alternate key [redacted] your Atari's keyboard while using the Shifter. The Shifter will act as if it were the Selector.

Thinning Control Information

Thinning is a special function, used [redacted] thin out small changes in control information from [redacted] selected Region.

After selecting a Region of control information, choose **Thin Region** from the Edit menu. The following dialog will appear.

The Minimum Time Numerical represents a time, in Ticks, between control values.

The Minimum Change Numerical represents [redacted] change in control values.

If the time taken between two events of control information is less than the Minimum Time set in the dialog, and if the degree of change between those two events is less than the Minimum Change [redacted] in the dialog, the second event will be deleted. For example, as in the dialog shown above, if the number of Ticks between two successive control events [redacted] less than sixteen, and if the difference in value between those events is less than sixteen, the second [redacted] will be deleted because [redacted] will have been considered insignificantly different from the previous event.

This approach to thinning lets you [redacted] out data that does not represent significant change from one control event to the next — of course, you decide what *significant* means.

Note: When you [redacted] either Numerical to 0, it will be ignored.

Smart Editing

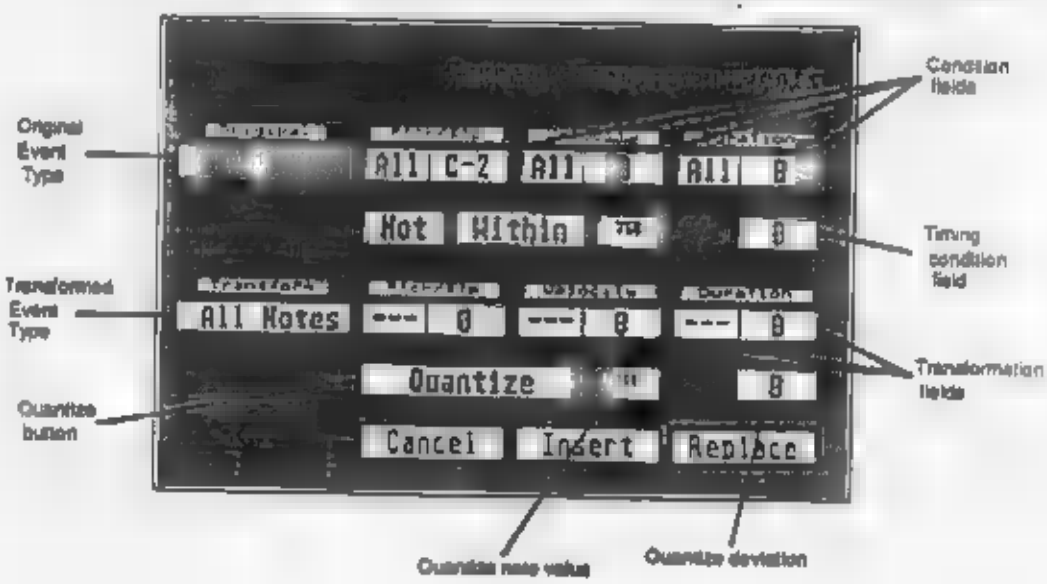
RealTime's Smart Editing feature [redacted] you select any [redacted] meeting certain conditions, from within a selected Region, and then transform that event into any other event according to rules you define. You can, for example, scale all the velocity values and durations of existing notes. Or you can transform aftertouch information into volume information [redacted] twice the value.

The event you select is called [redacted] **Original Event.** The event you change it into is called a **Transformed Event.**

The Original Event

Select [redacted] Region [redacted] described earlier in this chapter. [redacted] [redacted] that the Region you select includes the events you want to transform.

After you've selected [redacted] Region, [redacted] the following. Choose **Smart Editing** from the Edit menu. Or type Control-Q on the Atari keyboard. The following dialog will appear.



Describe the Original Event in terms of an event type, three condition fields, and a timing condition.

To select [redacted] event type, click on the Original button.

The Original pop-down menu will open.

Choose an event type from the menu. Notice the three different categories of note events. All notes includes all types of note events. Abs notes includes only note events whose pitches are specified within the event. Stp notes includes all Step note (S# and S?) events. We'll discuss Step notes in Chapter 7.

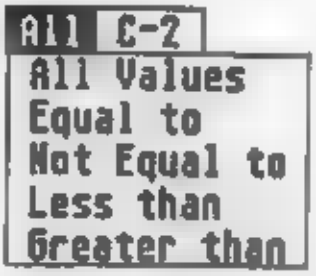
Note: If the Region you selected for Smart Editing was selected in the event area, Smart Editing will default to [redacted] Notes [redacted] the Original and Transformed Event types. If the Region you selected for Smart Editing was selected in the control display area, Smart Editing will default to that control as the Original and Transformed Event types.

After choosing an event type, you'll specify the conditions that the event must meet. Different types of events, however, generate different types of data to which the conditions will apply. Consequently, the [redacted] of the three condition fields will change according to the event type, although the conditions themselves will remain the same.

If the event type is [redacted] note, the condition fields will be pitch, velocity and duration. If the event type is tempo change, program or patch change, pitch bend, or aftertouch, only one condition field will be used, for data. [redacted] the [redacted] type is polytouch, two condition fields will be used, for notes and data. [redacted] the event type is controls, two condition fields will be used, for control number and data.

To specify a Condition for a condition field, click on a Condition button.

A Condition pop-down menu for that field will open.



Each Condition pop-down menu lets you choose a condition that the event attribute, represented by the condition field, will have to meet. Each Condition pop-down menu is also associated with a Condition Numerical, whose value is a part of the condition. If the condition of the pitch field is **Equal To**, for example, the Condition Numerical might be set to C3, in which case the entire condition would be "pitches equal to middle C."

The conditions and their meanings are as follows.

All Values means any value. This condition makes the Condition Numerical meaningless — don't worry about setting it.

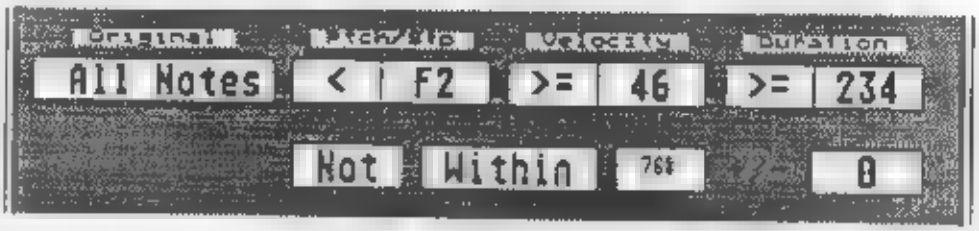
Equal to means equal to the specific value set in the Condition Numerical. If the event type were notes, and the condition field were pitch, with the Condition Numerical set to C3, the condition would specify every middle C within the selected Region.

Not Equal to means not equal to the specific value set in the Condition Numerical. If the event type were notes, and the condition field were pitch, with the Condition Numerical set to C3, the condition would specify every note within the selected Region that was not middle C.

Less than means less than the specific value set in the Condition Numerical. If the event type were notes, and the condition field were velocity, with the Condition Numerical set to 64, the condition would specify every note within the selected Region with a velocity of less than 64.

Greater than means greater than the specific value set in the Condition Numerical. If the event type were notes, and the condition field were velocity, with the Condition Numerical set to 64, the condition would specify every note within the selected Region with a velocity of [redacted] than 64.

Here's an example. If the event type [redacted] all notes, you could choose all notes lower than F2, with velocities greater than 46 and durations longer than 234 Ticks. It would look like this...



If the event type [redacted] a MIDI control, you could choose all MIDI controls equal to MIDI control #7 with values that [redacted] less than 64. It would look like this...

To select note events that fall [redacted] certain beats, or do [redacted] fall on [redacted] certain beat, use the Time condition. The following example will find all notes that do not fall on a quarter note +/- one 32nd note (remember that 24 Ticks equals one 32nd note)...

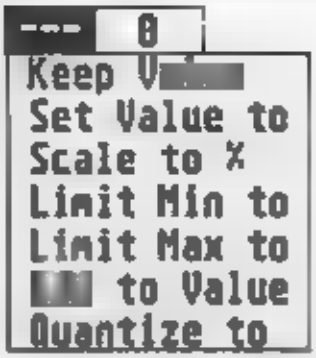
The Transformed Event

Once you've selected an Original Event, you're ready to specify a Transformed Event.

As with selecting an Original Event, you'll choose an event type. Instead of the condition fields, however, you'll work with transformation rules. And instead of the time condition, there's a quantization field.

Choose an Transformed Event type as you would choose an Original Event type.

Choose a transformation rule as you would choose a condition, and set the Transformation Numerical as you would set the Condition Numerical.



The transformation rules and their meanings are as follows:

Keep Value means that the value for the original event is preserved. If you want to keep velocity and duration while altering pitch of a note event type, for example, you would choose Keep Value for velocity and duration while changing pitch.

Set Value means that value of the Original Event will be set the specific value set in the Transformation Numerical. If the event type and number is MIDI control #7, for example, and you want to change the control number to 10, you would choose Set Value to and set the Transformation Numerical to 10.

Scale to means that the Original Event value will be scaled to the percentage set in the Transformation Numerical. If the event type is notes, and the transformation field is velocity, and you want to increase velocity by twenty percent, you would choose Scale to and set the Transformation Numerical to 120.

Limit Min to means that any Original Event value lower than the value set in the Transformation Numerical will be set to this value. If you were transforming a note's velocity, for example, and you wanted every note to have a velocity of at least 64, you would choose Limit Min to and set the Transformation Numerical to 64.

Limit Max to means that any Original Event value higher than the value set in the Transformation Numerical will be set to this value. If you were transforming a note's velocity, for example, and you wanted every note to have a velocity of no more than 64, you would choose Limit Max to and set the Transformation Numerical to 64.

Add to Value means that the number set in the Transformation Numerical is added to the value of the Original Event. If you want to transpose a note up an octave, for example, choose Add to Value and set the Transformation Numerical to 12. You can also add negative numbers. If you want to transpose a note down an octave, set the Transformation Numerical to -12.

Quantize to means that the Original Event value will be rounded to the nearest multiple of the Transformation Numerical. [redacted] you [redacted] to quantize note durations to quarter notes, for example, choose Quantize [redacted] and set the Transformation Numerical to 192, which is the duration, in Ticks, of a quarter note. All notes within the selected Region will change their durations [redacted] the *nearest* quarter note value — if a note is slightly longer than a whole note, it will become a whole note. Note: If you want to change all note durations [redacted] a specific value, use **Set Value to**. Or consider using one of the other transformation rules.

Applying the Transformed Event

Once you've specified an event type and [redacted] transformation rule, you have two options: **Insert** and **Replace**.

To add the Transformed Event to the Original Event, select **Insert**. If, for example, you transform pitch bend into aftertouch and insert the Transformed Event, you'll keep the original pitch bend and have aftertouch, too.

To substitute the Transformed Event for the Original Event, select **Replace**.

Deleting Specified Events

Define the Original Event that you want [redacted] delete.

Then choose **Delete** from the Transformed Event types. Any events meeting the Original Event conditions will be deleted.

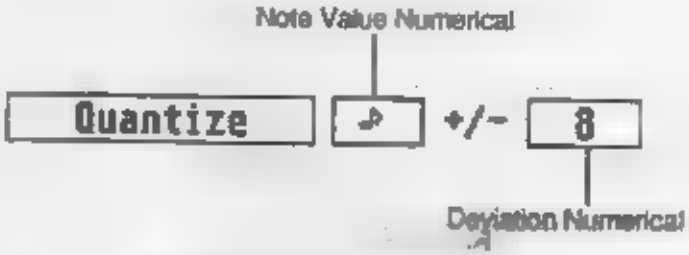
Quantizing Note Placement

Note quantization is probably one of the most obvious applications of Smart Editing.

To quantize note placement within a selected Region, do the following. Select the Region that contains the notes you want to quantize. Choose **Smart Editing** from the Edit menu. Or type Control-Q on [redacted] Atari keyboard. The Smart Editing dialog will appear.

The Original Event will default [redacted] All Notes, with any pitches, any velocities, and any durations.

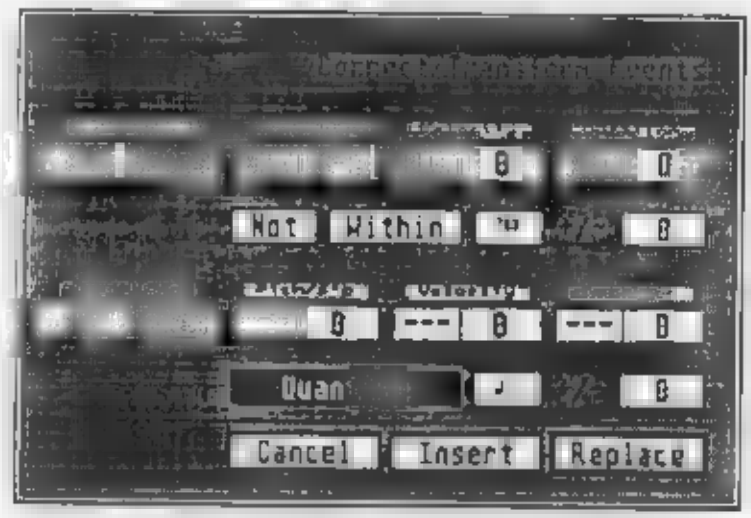
In the Transformed Event section [redacted] the dialog, enable the Quantize button. Then select a quantization value in the Note Value Numerical and a deviation value in the Deviation Numerical.



The Note Value Numerical defines the [redacted] value to which all notes in the selected Region will be quantized.

The Deviation Numerical [redacted] a range around the note value within which all notes-to-be-quantized will be moved. Notes previously [redacted] the range will be moved to within the deviation range. This lets you tighten up your rhythms without making them sound too mechanical.

The following dialog quantizes [redacted] notes to the nearest quarter-note.



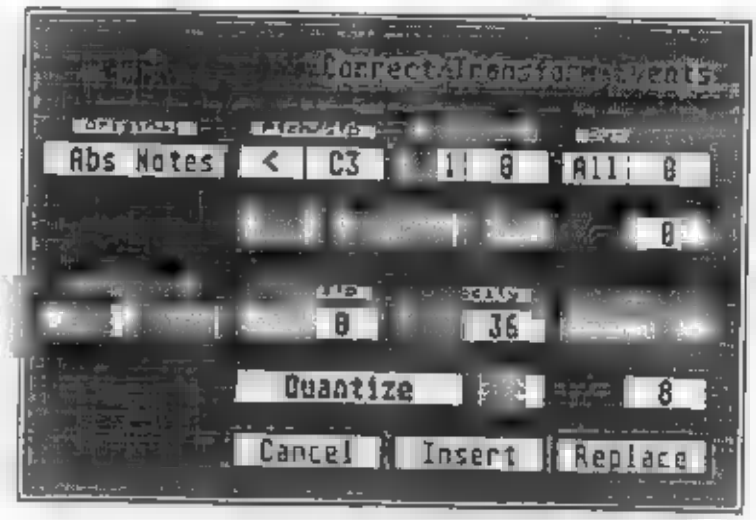
The following dialog leaves all notes within eight Ticks of [redacted] eighth note unchanged. All notes more than eight Ticks away from an eighth note will be moved to within eight Ticks from [redacted] eighth note.

Other Smart Editing Applications

Here are some other things you can do with Smart Editing.

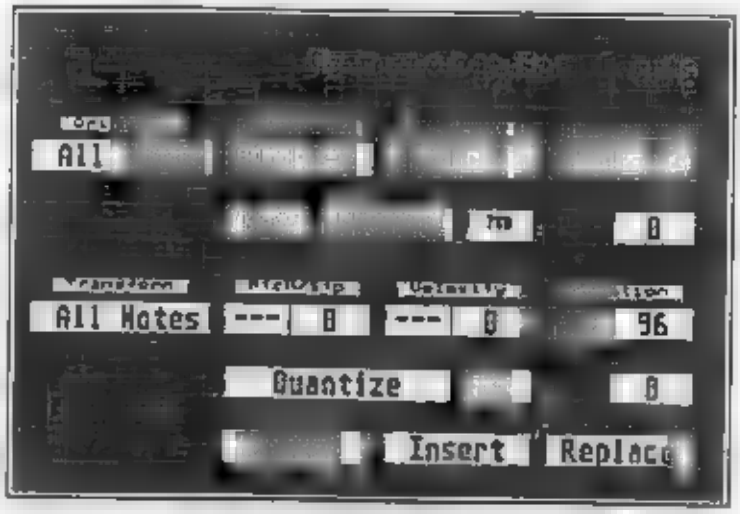
In the following dialog, [redacted] with [redacted] pitches in [redacted] selected Region will be converted [redacted] Step notes, with values of S1. This would [redacted] useful if you've recorded notes from a keyboard and want to "strip out" the pitches, leaving only the rhythms, velocities, [redacted]. Then you could create a new Track Definition for that track to insert different pitches or control [redacted] drum machine. We'll discuss Step [redacted] and Track Definitions [redacted] Chapter 7.

In the following dialog, a value of 36 will be added to the velocity value of any note below C3. The effect would be to accent any bass [redacted] in the selected Region.



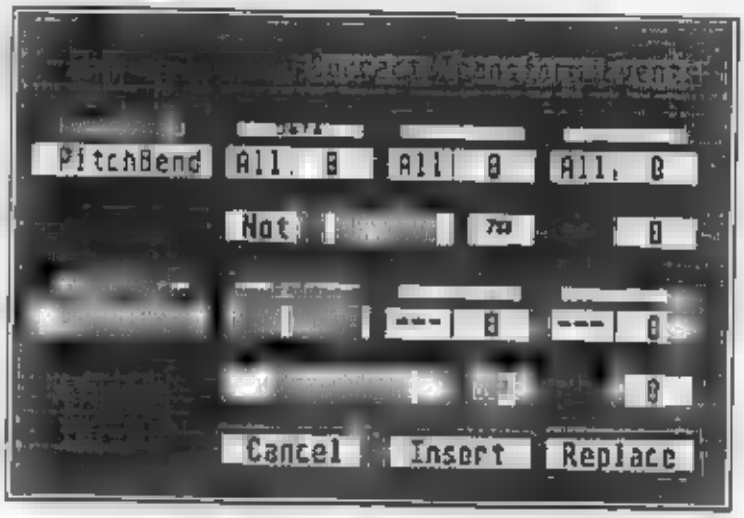
In the following dialog, any aftertouch data in the selected Region will be converted to MIDI control #7.

In the following dialog, the duration of any note whose duration is less than [redacted] Ticks will be set to 96 Ticks (96 Ticks is an eighth note).



In the following dialog, any polyphonic aftertouch information will be deleted in the selected Region.

In the following dialog, pitch bend information in the selected Region will be quantized to the nearest 2000 units. Pitch bend values range from -8192 to +8192. This would effectively convert continuous pitch bend into steps, with the [redacted] of the steps dependent upon your synthesizer's pitch bend response.



In the following dialog, velocity values in [redacted] selected Region will be quantized to the [redacted] multiple of 46. Velocity values range from 0 [redacted] 127.

In the following dialog, [redacted] pitch [redacted] information in the selected Region will be scaled by 200%, thereby doubling the depth of all pitch bend in the Region.

These are only a few of the many applications of Smart Editing. We're sure you'll find many different ways to use this powerful feature.

6 Library Entries and Songs

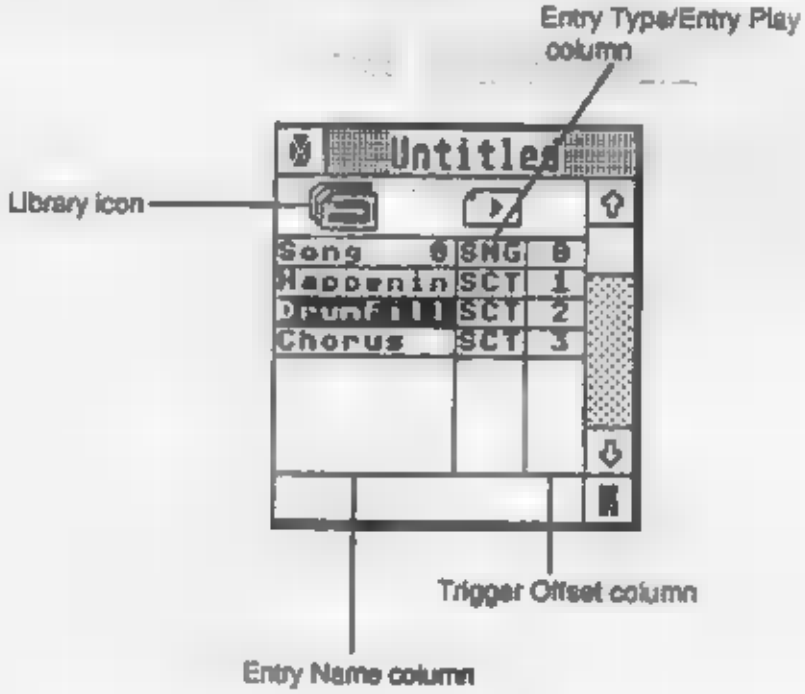
Whenever you create a Section or a Song in a RealTime workspace, it's automatically stored and listed in Library window. The Library window can contain any number of Sections or Songs, limited only by the size of your Atari's memory.

A Song is an entire composition, or, in other words, a chain of Sections and Songs. A Song window also can contain any number of Sections and Songs, limited only by the size of your Atari's memory. A Song can also contain a MIDI File, to be played simultaneously with the Song.

In this chapter, we'll show you how to use the Library window, how to use the Song window, and how to organize Sections and Songs into entire compositions.

The Library Window

The Library window contains several controls, shown as follows.



All of the Sections and Songs you create are stored in the Library window. Their names are listed in the Entry Name column. We refer to anything that appears in the Library window, whether Section, Song, or even a MIDI File, as an entry.

To open an entry from the Library window, double-click on its name. Or drag its name onto an open space on the desktop. Or select its name and then either choose Open Entry from the Library menu or type Control-O.

If you close the Library window, you can reopen it by choosing Show Library from the Library menu, or by typing Control-L.

To change the Library window's name, click on the Library icon with either mouse button. A dialog will appear. Type the Esc key to clear all existing text. Then type in a new name. Then click OK or press the Return key on your Atari's keyboard. Note that the name of the Library window is the name of your current workspace.

Organizing the Library Window

To copy an entry in the Library window, hold down the Alternate key and drag the entry to a new location. A dialog will appear. Type the Esc key to clear all existing text. Then type in a new name for the copied entry. Then click OK or press the Return key on your Atari's keyboard.

To delete an entry from the Library window, select its name in the Entry Name column and then choose Remove Entry(s) from the Edit menu. Or type Control-R.

Playing Entries from the Library Window

To play an entry from the Library window, make the window active. Then click in the Entry Play column next to the entry's name. If nothing happens, check to see if Record is enabled — if it is, disable it, and click again in the Entry Play column. To stop the playback, click on the Play button or press the Spacebar.

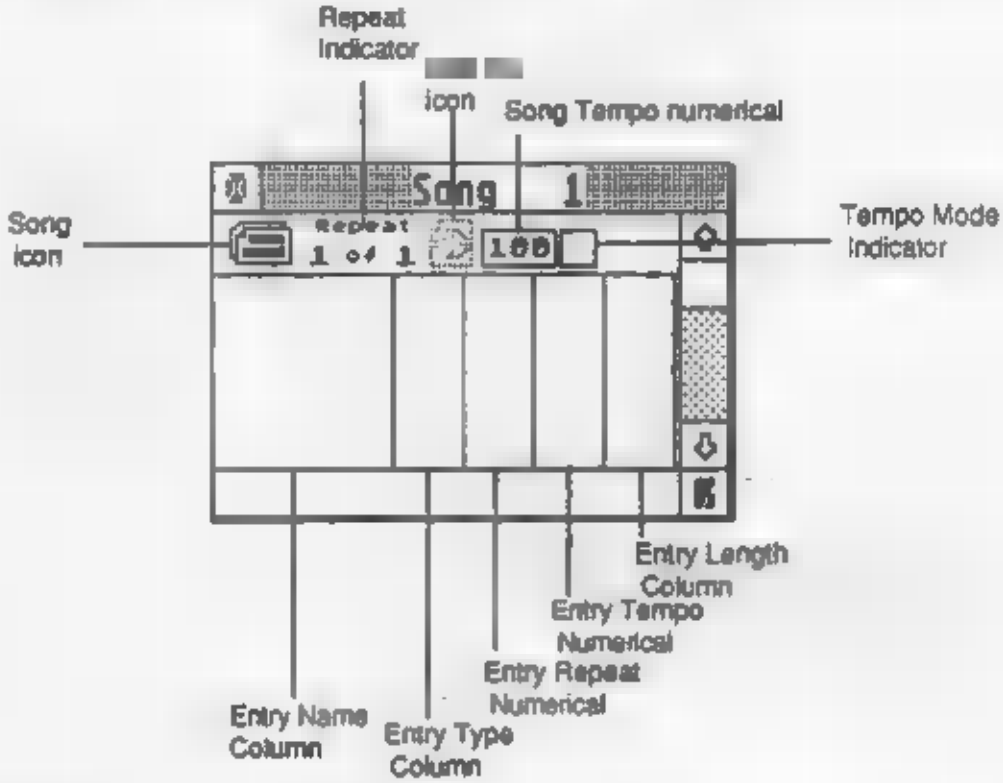
You can al play entries by typing the letter key on your Atari's keyboard that corresponds to the entry's location in the Library window. A would play the first entry, B the second, and so on. Note that the Library window must be active.

If one entry is playing and you trigger another, RealTime will wait until the current entry has finished until it begins playing the next. To cause the new entry to begin immediately, Alternate-click in the Entry Play column next to the entry's name.

Creating Songs

Songs are created in Song windows. A Song is a list of entries that are played from top to bottom. A Song can contain any entry except itself.

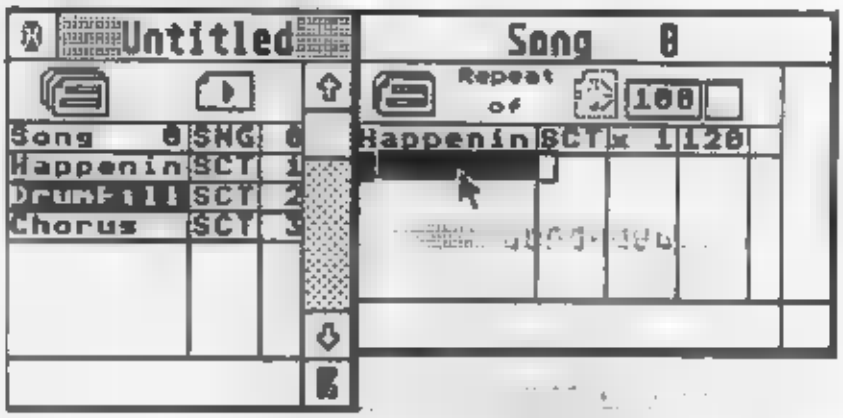
To open a new Song window, choose **New Song...** from the Library menu. The following window will appear.



To name the Song , click on the Song icon *with the right mouse button*. Or choose Edit Name... from the Library menu. A dialog will appear. Type the Esc key to clear all existing text. Then type in a name. Then click OK or press the Return key on your Atari's keyboard.

Building a Song

To build a Song, do the following. Select the Library window to make it active. Then drag the appropriate entries from the Library window into the Entry Name column of the Song window. Place the entries in whatever order you like. The new entry will be inserted wherever you place it.



To insert an entry between already-existing entries, drag the entry from the Library window to the Song window and place it over the entry that it will precede.

To [redacted] an entry to repeat during playback, set the appropriate Entry Repeat Numerical to whatever number you like. An entry can repeat up to 99 times and, as the Song plays, the Repeat Indicator will tell you which repetition you're hearing.

To move an entry from one location to another, drag its name to the new location. If you drag it over an already-existing entry, it will be automatically inserted after the already-e[illegible]ng entry.

To copy an entry to a new location, hold down the Alternate key as you drag the entry's name to a new location.

To delete an entry, select the entry's name in the Entry Name column. Then choose **Remove Entry(s)** from the Edit menu. Or type Control-R.

To select several entries, hold down the Shift key as you select the entries' names in the Entry Name column.

Notice that the Entry Type column indicates whether the entry is a Section or a Song.

The Entry Length column indicates either the number of bars that a Section contains or the number of Sections within a Song. This value cannot be changed from within this window.

Playing ■ Song

To play ■ Song, do the following. Be sure the Song window is active. Then click on the Play button (in the Control Strip) ■ press the Spacebar. The Song will play through once.

You can also play ■ Song from the Library window. Be ■ the Library window is active. Then click in the Entry Play column for ■ Song.

To play ■ Song repetitively, drag it from the Library window ■ an entry into ■ Song window, set its Entry Repeat Numerical to whatever you like, then play the Song which contains it.

To start ■ Song from somewhere other than its beginning, click in the Entry Type column at the entry where you want the Song to start. The Song will play from that point on. The entry will play for its full number of repetitions before the Song moves to the next entry.

Changing Tempo

There are two ways to change tempo in ■ Song. You can change the tempo of the entire Song. Or you can change the tempos of the individual entries.

There are two ways to change the tempo of an entire Song. You can scale the entries' tempos by a given percentage, which is useful if the original entries have different tempos. If some entries are slow and some are fast, scaling their tempos will preserve the differences between their tempos while changing the overall, specific tempos at which they'll play. Or you can cause all of the entries to play at the same fixed tempo.

To scale the entries' tempos by ■ given percentage, set the Tempo Mode Numerical to %, which mea. percent mode. Then set the Song Tempo Numerical to a percentage of the entries' tempos. If you set the Song Tempo Numerical to 100, for example, the entries will play at 100% of their original tempos. If you set the Song Tempo Numerical to 200, the entries will play twice ■ fast as their original tempos.

To cause all of the entries to play at the same fixed tempo, set the Tempo Mode Numerical to =, which is fixed mode. Then set the Song Tempo Numerical to the specific tempo at which all entries will play.

To change the tempos of the individual entries, set the Tempo Mode Numerical to be blank, then change each entry's tempo individually in the Entry Tempo Numerical column.

Solo on Top of a Song

Once you've created a Song, you might want to lay down a solo track on top of it. You might have created a Song of drum parts for example, specifically so that you can solo above it.

There are two ways to solo on top of a Song. You can solo on top of the Song as the Song plays. Or you can convert an entire Song to one linear Section and play on top of the Section.

Record as the Song Plays

You can play an entire Song with the Record button enabled and record on top of it, as it plays. This will cause whatever part of the solo you're playing to be recorded into whatever entry is currently being played within the Song. Your solo will be recorded just as if you were recording directly into the entry.

If you use this technique, however, you may want to set up your Song structure so that no entry plays more than once, because if an entry repeats, the part of the solo recorded into that entry will repeat along with entry.

To set up your Song structure so that no entry plays more than once, make single-play copies of repeated entries, rather than using the repeat options within the Song. You'll have to use the Library window to do this, and then drag the single-play entries into the Song window in the appropriate places. The reason you have to use the Library window to make single-play copies of entries is that copying an entry in the Song window copies only a "pointer" to the entry, rather than the entry itself. A Song consists of nothing more than pointers to entries in the Library window.

Converting Entire Song One Linear Section

To convert a Song to one linear Section, make a Movie of the entire Song, as described in Chapter 11.

Once you've made a Movie, save it to disk as a MIDI File. Then open a new Section and import the whole MIDI File into the Section. All the parts will be broken out into their proper track assignments and channel names. You can then record your solo across the Section as you would normally.

Playing MIDI Files with a Song

A Song can contain a MIDI File. The MIDI File is not treated as an entry, however, but rather as a parallel process which will play along with the Song.

The MIDI File button in a Song window will be enabled if the Song contains a MIDI File. When the MIDI File button is enabled, you click on it to highlight it, thereby causing the MIDI File to play back along with the Song.

The MIDI File is saved with the Song when the document is saved.

7 Musical Palettes

We've designed RealTime so that you can think musically, instead of technically, as you work with RealTime, and so we've devised a way to let you think of loudness in musical dynamics (pp, mp, mf, f, and ff, for example) and articulations as moving in increments from staccato to legato.

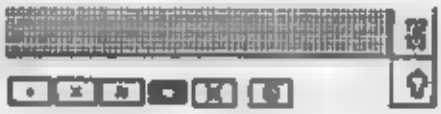
Consequently, to help you paint notes graphically, with different velocities and articulations, we've created Palettes of velocity and articulation values. We've also devised a way for you to create Palettes of pitches. We think you'll find that these features will help you to make music *faster*, more accurately, and more interactively.

In this chapter, we'll show you how to define and use the Velocity Palette, the Articulation Palette, and how to set up a synth Device.

Preset Velocities

The point of using preset velocities from the Palette is that they provide a quick and easy way for you to choose a basic value *while you're painting*. You can also deviate from that preset value, as we're about to describe.

Look at the Velocity Palette, at the right of the Section Bar.



The Velocity Palette contains five different Strike Symbols, which represent five different preset velocity levels.

To choose one of the Strike Symbols from the Velocity Palette, click on it.

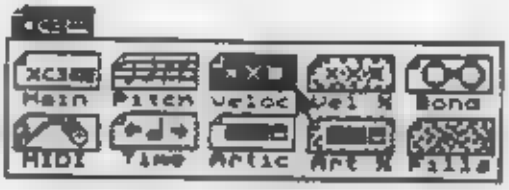
Or press one of the Function keys (F1 — F5) on your Atari's keyboard.

The cursor will become the Strike Symbol you choose. As you paint with it, you'll be inserting the Strike Symbol in a track.

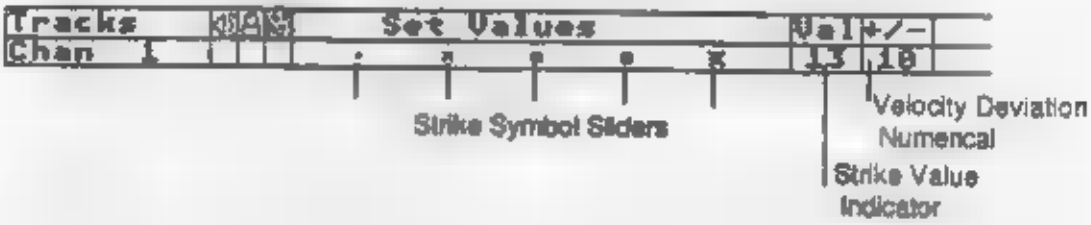
Changing Velocity Values

You can change velocity values for the Strike Symbols individually for each track.

Select **Veloc** in the View drop-down menu.



The Velocity View of the Section window will appear.



Then, to give a Strike Symbol in a particular track a particular velocity value, drag it to the left or right within the Set Values column for that track. The current value is indicated in the column under Val.

Note that you cannot scramble the order of the strike symbols. This is to ensure that the smallest strike always represents the lowest velocity, even if the difference between it and its neighbor is minute.

Note also that by changing the value for each strike, you're changing not only the values for the strikes you're about to paint — you're also rescaling the velocities for the notes already recorded in the track. This allows you to adjust a track's velocities. If the loud strikes are a little too loud, try lowering only the big strike symbols. Soft part too soft? Try raising the smaller strikes.

Velocity Deviation

The Velocity Deviation Numerical lets you set a range of automatic deviation for all the velocities in a track. The range is set as plus or minus a certain amount. If the preset velocity is 64, for example, and the Velocity Deviation Numerical [redacted] for plus or minus 10, that track's velocities will vary between 54 and 74.

To set a range for Velocity Deviation, change [redacted] Velocity Deviation Numerical.

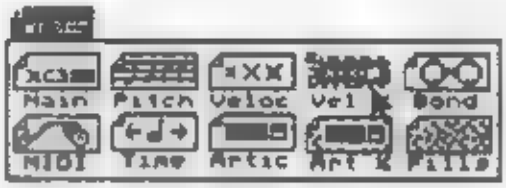
Note that the setting of the Velocity Deviation Numerical will apply to the velocities of all notes in a track, even those that were recorded through MIDI.

Random Strikes

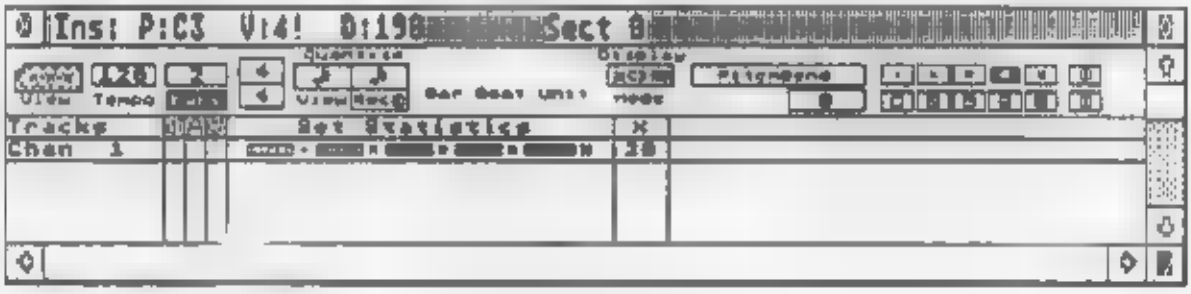
You may have noticed that there are, in fact, six Strike Symbols in the Palette, one slightly separate and to right of the other five. The sixth symbol lets you paint random strikes — by which we mean strikes randomly chosen from the five specified strike values. This allows you to introduce a wide range of velocity variation into your music.

The (key — the open parenthesis key — on your Atari's numeric keypad calls up the Random Strike.

How RealTime chooses from among the five preset velocities is determined in the Velocity Probability view. To open the Velocity Probability view, select Vel ■ in the View pop-down menu .



The Velocity Probability View will appear.



You'll see a series of bars with velocity symbols next to them. Each of the symbols acts as a Slider to change values. The length of a bar to the left of a symbol determines the probability with which that symbol will be chosen.

To increase or decrease the probability with which a symbol will be chosen, click on the symbol and drag it to the left or right. The longer the bar, the higher the probability. The exact probability is shown as a percentage in the % column.

Note that as you drag the Sliders, you're changing the adjacent value, to the right, as well. Since the total probability of ■ ■ symbols can't ■ higher than 100%, something has to give. Note also that the rightmost symbol doesn't move — its value will change in relation to the others, and you can see its value in the ■ column when you click on it.

Preset Articulations

Durations are normally shown as gray lines of specific, absolute lengths in a track's event area.

Articulations are like durations in that they make a note shorter or longer, but they differ from durations in that they're calculated as a percentage of the time from the beginning of one note to the beginning of the next event — whether note, rest, or loop point. If a note has an Articulation value of fifty percent, for example, the note will sustain for one half of the time between the note's beginning and the next event's beginning. If the note is followed by another event an eighth note later, the note will sustain for a sixteenth note — half of an eighth note's duration.

The point of using preset articulations from the Palette is that they represent a quick and easy way for you to choose a basic value *while you're painting*. You can also deviate from that preset value, as we're about to describe.

Look at the Articulation Palette, at the right of the Section Bar, under the Velocity Palette.

To choose one of the symbols from the Articulation Palette, click on it.

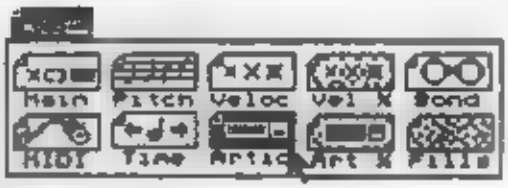
Or press one of the Function keys (F6 — F10) on your Atari's keyboard.

As you paint Strike Symbols, you'll also be inserting the articulation symbol in a track.

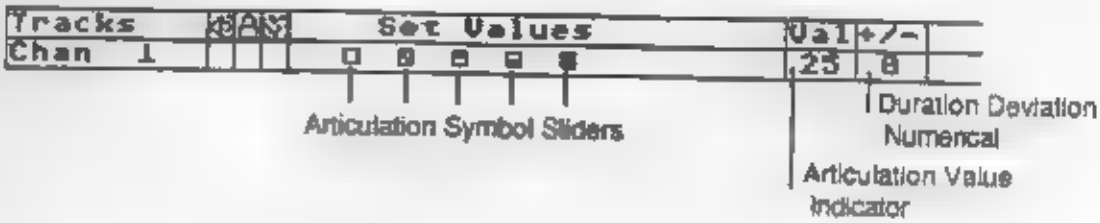
Changing Articulation Values

You can change articulation values individually for each track.

Select Artic in the View drop-down menu.



The Articulation View of the Section window will appear.



To give an articulation symbol a particular articulation value, drag it to the left or right. The value is indicated as a percentage in the column under Val.

Articulation values can be set from 3% to 375%. Notice that you [redacted] scramble the order of the articulation symbols.

If you change articulation values for a track, [redacted] that use articulation will be affected, but notes that have fixed durations will *not* be changed.

Duration Deviation

The Duration Deviation Numerical lets you set a range of automatic deviation for all the durations and articulations in a track. The range is set in Ticks. A value of 24, for example, would cause durations and articulations to vary between 24 Ticks longer and 24 Ticks shorter than their normal values.

Note that the setting of the Duration Deviation Numerical will apply to the durations of all notes in a track, even those that were recorded through MIDI.

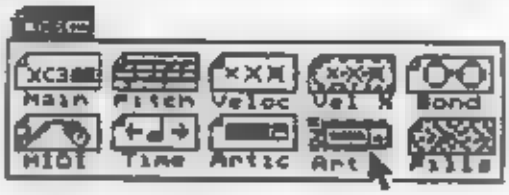
To set a range for Duration Deviation, change the Duration Deviation Numerical.

Random Articulations

You may have noticed that there are, in fact, six articulation symbols in the Palette, one slightly separate and [redacted] right of the other five. The sixth symbol represents a random articulation — by which we mean articulations randomly chosen from the five specified values.

The) key — the close parenthesis key — on your Atari's numeric keypad calls up the Random Articulation.

How RealTime chooses from among [redacted] five preset articulations is determined in the Articulation Probability view. To open [redacted] Articulation Probability view, select Art % in the View pop-down menu.



You'll see a series of bars with articulation symbols next to them.

Each of the symbols acts as a Slider to change values. The length of a bar to the left of a symbol determines the probability with which that symbol will be chosen.

To increase or decrease the probability with which a symbol will be chosen, click on the symbol and drag it to the left or right. The longer the bar, the higher the probability. The exact probability is shown as a percentage in the [redacted] column.

Note that as you drag the Sliders, you're changing [redacted] adjacent value, to the right, as well. Since the total probability of [redacted] the symbols can't [redacted] higher than 100%, something has to give. Note also that the rightmost symbol doesn't move — its value will change in relation to the others, and you can see its value in the [redacted] column when you click on it.

Didn't that [redacted] strangely familiar?

Preset Pitches

In earlier chapters, we've described letters and numbers representing *specific* pitches. But a track can also contain Step notes.

[redacted] Step note is represented by an S and a number or question mark. The number represents the Step note's position in a collection of preset pitches, which we call a Track Definition. The question mark represents [redacted] indefinite step, which we'll explain below.

Creating tracks with Step notes allows you to superimpose different melodies, keys, chord progressions, and other pitch patterns, on rhythms already in a track. You can, in other words, use the Step notes in a track as a rhythmic template on which to superimpose different pitches.

It also allows you to vary the melodic or chord character of an entire track as it plays. You could, for example, create a Track Definition with chords in C major. Then you could create another Track Definition with chords in C minor. Then you could replace all the major chords in a track with minor chords just by dragging the C minor Track Definition into the Section window.

Track Definitions with Step notes are created in Synth Device windows.

Creating a Synth Device

To create a Synth Device with a keyboard, follow these steps:

1. Choose the Open command next to the MIDI channel that corresponds to the receive channel of one of your synthesizers. The name of the MIDI channel will be displayed in the Menu Bar and a Device window will appear, with a Track Definition ready for input.

2. Type in the name of the Track Definition, for example "HitTune." Notice that the name becomes "active." To register the name, press the Enter key on your Atari's keyboard.

3. Enable MIDI by clicking on the MIDI icon.

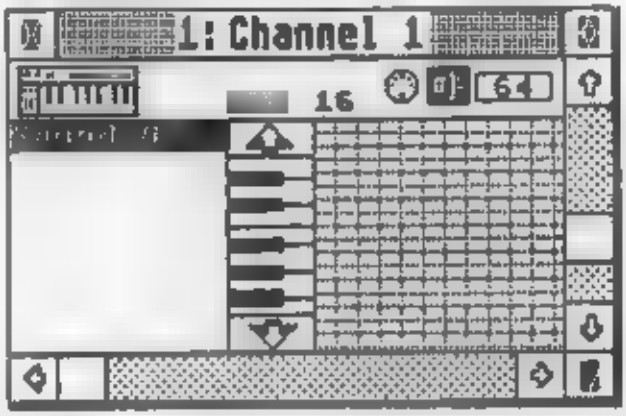
4. Play in several pitches and/or chords. Note that chords are entered in Build Mode, which means that you hold down one key while playing other keys to enter a chord — as long as one key is held down, everything you play will be recorded in a single Step as part of a single MIDI event. If you're not sure how to correct your mistakes, see "Editing Your Track Definitions" below. Caution: If you play several notes in such a way that they overlap, Build Mode might mistake them for chords — the solution is to play staccato for entering a series of single pitches.

5. To open another Track Definition for input, press the Return key on your Atari's keyboard. Or click under the existing Track Definition.

6. Repeat Steps 2, 3, 4, and 5 until you've created all of the Track Definitions you'd like to create. Then close the window.

To create a Synth Device without a MIDI keyboard, enter pitches manually in the Definition Grid. Follow these steps.

1. Choose the **Open** command next to the MIDI channel that corresponds to the receive channel of one of your synthesizers. The name of the MIDI channel will be displayed in the Menu Bar and a Device window will appear, with a Track Definition ready for input.



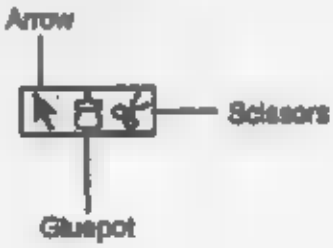
2. Type in the name of the Track Definition, for example "HitTune." Notice that the name becomes "active." To register the name, press the **Enter** key on your Atari's keyboard.

3. With the name of the Track Definition still selected, click in the first Step in the grid, at the Level which represents the first pitch you'd like to enter. You can enter as many pitches as you like into a single Step. You can test your pitch selections before entering them by clicking on the keyboard to the left of the grid. Click in successive Steps until you've entered all the pitches you want to enter. If you're not sure how to use the grid, see "Editing Your Track Definitions" below.

4. Repeat Steps 2 and 3 until you've entered all of your Track Definitions' pitches.

Editing Your Track Definitions

Move the mouse into the Definition Grid and open the Device Toolbox by clicking *with the right mouse button*. Then select a tool by clicking on it with either mouse button. The mouse cursor will change to become the tool.



Use the Arrow, which is the [redacted] tool, to click pitches in and out. Click in [redacted] empty box to add a note, or click on a filled-in box to erase a note.

Use the Scissors to delete a Step. Click within the area of the Step.

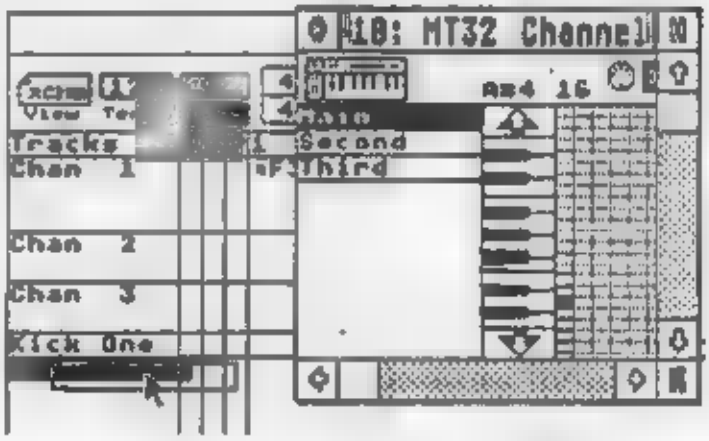
Use the Glue Pot to insert a new Step *before* the Step in which you click.

To change the name of a Track Definition, close the Device Toolbox, select the track name, press the Esc key to clear all existing text, type in a new name, and press the Enter key.

Using Synthesizer Track Definitions

Once your Track Definitions are completed, you can use them as tracks in a Section window. You can also drag them into existing tracks to superimpose their pitches with the information already in [redacted] track, with the result that you change the pitch information in the track without changing its rhythmic characteristics — you can change minor chords to major chords, chords in one key to chords in another key, and so [redacted]

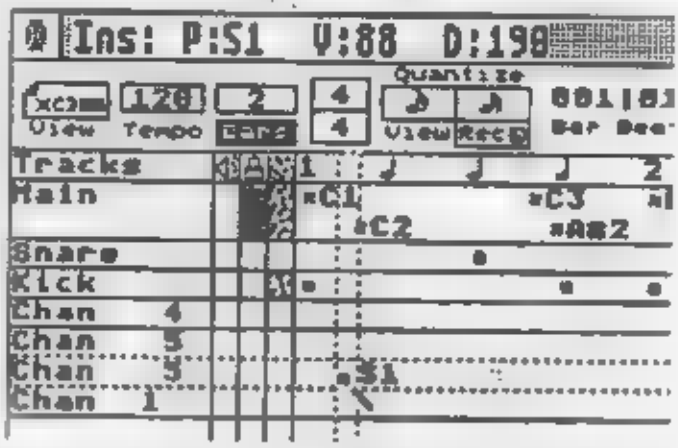
To use a Track Definition in a track, drag its [redacted] from the Device window into the Track Names column of the Section window.



You can drag *all* track definitions from a Device window into a Section window by dragging the Device icon into the Track Names column of the Section window.

When you've got your Track Definitions in place, close the Devices window. Then start the music.

Type S1 ■ your Atari's keyboard. Then, using the Striker, paint a note into the track. You've painted a symbol that corresponds ■ the first Step in your Track Definition. Note that P:S1 appears in the Event Information Line in the Section window.



Pitches are shown in the Event Information Line as an S followed by ■ number indicating the Step in the Track Definition which they represent. Choose the Step you want to paint by typing S, then, using the number keys above your Atari's alpha-numeric keyboard, the number of the Step. Then click with the Striker wherever you want to insert the Step in the track.

To scroll through Step numbers as you place a note, type S, then hold down the Shift key on your Atari's keyboard and, when you click with the Striker, hold down the mouse button and move the mouse up or down.

The lowest value will be S?, which is an indefinite Step. S? will also result if the Step number yc . choose exceeds the number of Steps in the Track Definition.

To paint an S? Step, type S, *not* followed by a number, *or* type ?, then click with the Striker wherever you want to insert the Step in the track.

An indefinite Step is a Step that is not specifically defined but draws its pitch information from the Track Definition. As a track plays back, the S? Steps will play each Step in the Track Definition in order — the first time one plays, it will play the first Step, the second time one plays, it will play the second Step, and ■ on.

You can also randomize the order in which S? Steps are played.

RealTime's Note Ordering feature lets you mix the order with which the Steps appear in the Track Definition window with an algorithmic ordering of those Steps. You can transform your melodies to vary continually within bounds you set, and you can randomize the sounds that ■ drum track will play, among other applications.

To randomize the order of S? Steps, use the Ordr Numerical in the Pitch View of the Section window.

The Ordr Numerical affects the order in which pitches are chosen for any note painted as an S? Step.

If the Ordr Numerical is set at [illegible] the S? Steps will always be chosen in the order that the Steps appear in the Track Definition window. At 0%, the Steps are randomly chosen from the Track Definition window. Any other value will produce a mix of this determined or randomized order of Steps. At 50%, for example, fifty percent of the S? Steps will be played in the order in which they're placed in the Track Definition and fifty percent will be randomly ordered. At 60%, sixty percent of the S? Steps will be played in the order in which they're placed in the Track Definition and forty percent will be randomly ordered.

Editing Track Definitions Used in a Section

Any track's current Track Definition can be viewed and edited by double-clicking on the track's name or by dragging the track's name onto an open area on the desktop. When you do, a Device window which contains all the Section's Track Definitions will appear. This Device window differs from the standard Device window in that it contains only those Track Definitions currently in use in the Section, rather than all available Track Definitions in the Device.

The Device window will display the Track Definition for the track you clicked on. The selected Track Definition can be edited by clicking in the Edit Grid in the usual way. Any other Track Definition can be selected by clicking on its name in the Device window.

Note that editing the Track Definition in a Device window opened from a Section will not affect Track Definitions in the Devices — it will only affect the one track in the Section. Also note that if a Track Definition is altered in this Device window, it will not be subject to global replacement as described in Chapter 3.

Copying Track Definitions Used in a Section

To copy any track's Track Definition into another track, within the same Section window or in another Section window, Control-drag the name of the source track over the destination track's name.

8 Intelligent Features

In addition to power, speed and realtime interaction, RealTime puts a set of entirely new and powerful tools at your disposal — including probabilistic Loop Points, Track Bondage, Time Deviation, Pitch Manipulation, and Automatic Fills. We think they'll take a lot of the drudgery out of working with a sequencer and provide an interesting way of experimenting with new ideas.

In this chapter, we're going to show you how to use them.

Probabilistic Loop Points

A Loop Point causes a track to loop.

To place a Loop Point, do the following. Select the Loop Tool from the Section Toolbox.

Then position the cursor at the point in the track where you want to place the Loop Point. Then click. A Loop Point can be placed anywhere in a track, and there can be as many Loop Points in a track as you like.

When a track's display includes pitches, a number appears next to the Loop Point and in the Event Information Line in the Section window.

The number indicates the probability with which the Loop Point will cause the track to loop. A Loop Point with a probability of 100% will *always* cause a track to restart. A Loop Point with a probability of less than 100% will be more or less *likely* to cause a track to restart, depending upon the probability. If a Loop Point is set at 50%, for example, the track has a 50% chance of looping and a 50% chance of continuing. When a Loop Point does not cause a track to loop, the track continues to play as if the Loop Point weren't there.

To set the probability for a Loop Point, use the up and down arrow keys on your Atari's keyboard as you place the Loop Point in a track. Or scroll a value by holding down the Shift key while holding down the mouse button and moving the mouse up and down.

To change the probability of an already existing Loop Point, select the Monkeywrench from the Section Toolbox, position the tip of the Monkeywrench over the Loop Point, hold down the mouse button, and move the mouse up and down.

To insert a Loop Point with 100% probability at the end of all tracks in a Section, choose Loop Ends from the Special menu.

Eliminating Unwanted Section Looping

When the Bars button is enabled, Section Looping is enabled — which means that a Section will loop at the number of bars specified in the Bars Numerical. If Loop Points are inserted in all of the individual tracks in a Section, however, Section Looping might introduce an unwanted loop.

To override the Section Looping feature, disable the Bars button.

Why Have Probabilistic Looping?

Probabilistic Loop Points provide you with a means for varying phrases.

Set up an ten-bar phrase, for example, with a 20% Loop Point at the end of the eighth bar. Play the phrase, and notice that the track restarts most of the time after eight bars, but occasionally adds an extra two-bar Fill at the end.

Or set up an eight-bar phrase with Loop Points at the ends of bars 2, 4, and 6. Set the probabilities for each loop to 50%. Or try out low-probability (say, 5% or 10%) Loop Points every two beats.

Time Deviation

Time Deviation allows you to vary the timing with which notes are placed in tracks, so that they can be made to occur automatically slightly before or after their actual placement. This operation emulates the rhythmic inexactitude of a live performance, creating a "softer," or more "human" feel to your rhythms. In short, Time Deviation can help you introduce the "feel factor" into your music.

To use Time Deviation, do the following. Select Time in the View drop-down menu.

Be sure that the Dev button reads on. Then adjust the Time Deviation Numericals to upper and lower deviation limits.

The Time Deviation Numericals — **Low and Hgh** — describe the upper and lower limits of a range within which notes will be randomly played back. Zero represents the actual placement of a note. A negative number means *in advance of* actual placement. A positive number means *following* actual placement. Each Numerical can be set from -96 to +96 Ticks. The lower limit can't be set higher than the upper limit, and the higher limit can't be set lower than the lower limit, so if you change one to be beyond the other, they'll change together.

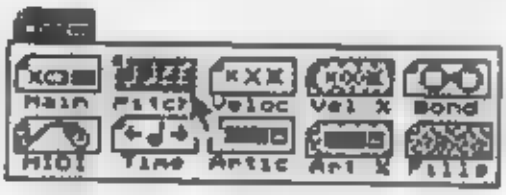
Here's an example. Choose a track. Set the lower limit to -48 and the upper limit to +48. Listen, and notice that individual notes are shifted before and after their actual placements. Then set the lower limit to +48 and the upper limit to +98. Now the notes are always somewhere behind the beat. Then set both limits to negative values, and the notes will always play somewhere before the beat.

Note: If a note falls on bar 1, beat 1, Tick 0, and if the track is shifted or deviated with a negative value, then the first note will still fall on 001:01:000. Notes that follow will be shifted or deviated as specified. We're afraid that RealTime can't go backwards in time — but we're working on it.

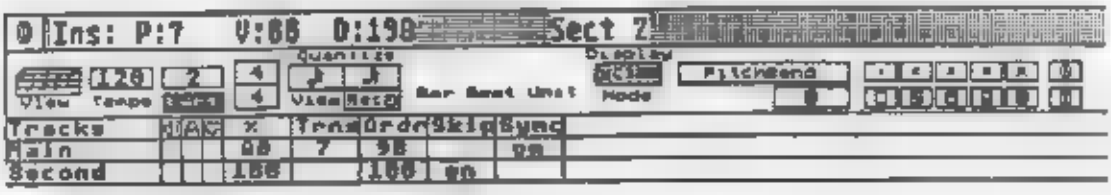
Note Density

Note Density allows you to set the probability with which any recorded note will be played. Use Note Density to achieve non-beat-oriented rhythms, or non-rhythmic textures, or orchestration effects of doubled lines that don't *always* play together, or improvisational variety, or — you'll find many uses for it.

To set the Note Density of a track, select **Pitch** from the **Views** pop-down menu.



The Pitch View of the Section window will appear.



Adjust the track's % Numerical.

This is how Note Density works. When RealTime sees a note on a track, it asks itself whether or not to play that note. If you've set the Note Density Numerical for that track to 50%, each note in that track will be played 50% of the time. The other 50% of the time, it won't be played. You can't predict exactly when each note will be played and when it won't, but you can predict the probability.

Note Order

RealTime's Note Ordering feature lets you mix the order with which the Steps appear in the Track Definition window with an algorithmic ordering of those Steps. You can transform your melodies to vary continually within bounds you set, and you can randomize the sounds that a drum track will play, among other applications.

To randomize the order of S? Steps, use the Ordr Numerical in the Pitch View of the Section window.

The Ordr Numerical affects the order in which pitches are chosen for any note painted as an S? Step. See "Using Synthesizer Track Definitions" in Chapter 7 for a discussion of painting S? Steps.

If the Ordr Numerical is set at 100%, the S? Steps will always be chosen in the order that the Steps appear in the Track Definition window. At 0%, the Steps are randomly chosen from the Track Definition window. Any other value will produce a mix of this determined or randomized order of Steps. At 50%, for example, fifty percent of the S? Steps will be played in the order in which they're placed in the Track Definition and fifty percent will be randomly ordered. At 60%, sixty percent of the S? Steps will be played in the order in which they're placed in the Track Definition and forty percent will be randomly ordered.

Track Bondage

Track Bondage allows you to [redacted] a new track to an already-existing track and create variations on the already-existing track's part. Use Track Bondage for orchestration, for rhythmic emphasis, or for algorithmic variation.

Slaving Aspects of One Track to Another Track

To slave aspects of one track to another track, you need two tracks: a Slave track and a Master track. Any track can be a Slave and any track can be a Master. In fact, any number of tracks can be Slaves to one Master — although, as the old saying goes, one track cannot be Slave to two Masters.

For purposes of this explanation, however, open a new track for the Slave. Select a channel or Device from the Channel menu. Then click under the track names in the Track Names column in the Section window.

Then choose Bond from the View pop-down menu. The Bondage View of the Section window will open.

To select a Master track, choose its name with the Master Numerical in the Slave track.

If your Slave track has notes recorded in it, you won't hear them once you've selected another Master. Once you've slaved one track to another, the Slave track's name is shown in gray. The events in the Slave track are no longer played, but will remain in the track.

Start the Section playing. [redacted] all tracks except the Slave track. You should be hearing [redacted] Master played back through the Slave's channel and sounds.

When the Strk button is enabled on the Slave track, the Slave track's velocities will be based on the Master's Strike Symbols, but interpreted according to the values set for the Strike Symbols in the Slave's Velocity View. When the Strk button is disabled, then the Slave Track's velocities will be chosen randomly from the Slave track's Velocity Palette values. To [redacted] the Velocity Palette values for the Slave track, choose **Veloc** from the Views pop-down [redacted]

When the Pitch button is enabled on the Slave track, its pitches will be exactly the same as the Master's pitches, with the exception of Step notes, which will be chosen from the Slave track's Track Definition. When the Pitch button is disabled, the Slave Track's pitches will all be chosen from the Slave's Track Definition. If the Track Definition is empty, the Slave track won't play anything. If the Master contains Step notes, and the Slave track has no Track Definition, the Slave track won't play the Step notes.

When the Artc button is enabled on [redacted] Slave track, the Slave track's articulations will be exactly the same as the Master's articulations, but interpreted according to [redacted] values set for the articulations in the Slave's Articulation View. When the Artc button is disabled, then articulations *and* durations will be chosen from the Slave track's Articulations Palette values.

The remaining buttons — **Bend** (pitch bend), **CPrs** (channel pressure), **PPrs** (polyphonic aftertouch), **Ctrl** (controls), and **Loop** — are filters which determine whether or not the Master's information represented by the button will by played by the Slave. When the button reads on, the Master's information will be played. When the button is blank, the Master's information will not [redacted] played.

Creating Variation in [redacted] Slave Track

Here are s[redacted]e suggestions for varying the Slave track. [redacted] trying out the possibilities, you might want to listen to Master and Slave together.

Try adjusting Transposition in the Pitch View. Or Note Density.

Try adjusting Track Shift in the Time View.

In the Track Bondage View, try disabling the Strk or Artc buttons in the Slave track and fiddle with the Velocity and Articulation Palettes in the Velocity and Articulation Views. Try disabling the Pitch button for the Slave track and painting notes into a new Track Definition.

Slaving Aspects of [redacted] Track [redacted] Itself

A track by default is a Slave to itself. In other words, the track name in the Master Numerical is its own.

When a Track is its own Master, you can disable the Strk, Pitch and Artc buttons for automatic variation of the musical material recorded in the track.

If you disable the Strk button, velocities will be chosen from the Velocity Palette.

If you disable the Pitch button, notes will be chosen from the track's Track Definition rather than from the Track's event area. If there are no notes recorded in the Track Definition, you won't hear anything.

If you disable the Artc button, articulations will be chosen from the Articulation Palette.

If you disable the Bend, CPrs, PPrs, Ctrl, and Loop buttons, then pitch bend, channel pressure, polyphonic aftertouch, controls, and Loop Points will be filtered out on playback.

Fills

Fills are used to automatically vary and enhance your basic patterns and tracks. Rather than specify every event in a track, you can set up a basic framework for a track and let RealTime add its own details based on parameters you define.

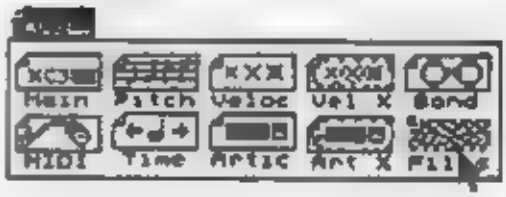
How Fills Work

A Fill is a new note added between already existing notes. When Fills are enabled, the rhythmic space between existing notes is divided into smaller parts and "filled" with extra notes. Fills are a way to introduce variations in your music.

To enable or disable Fills for a track, click in the Fills Enable column next to the track's name in the Section window.

Fills are defined in the Fills View of the Section window.

To select the Fills View, choose Fills from the View pop-down menu.

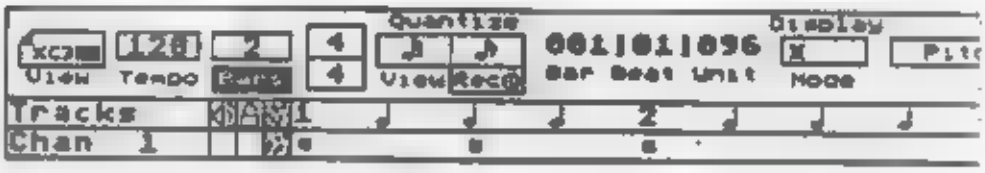


The Fills View of the Section window will open.

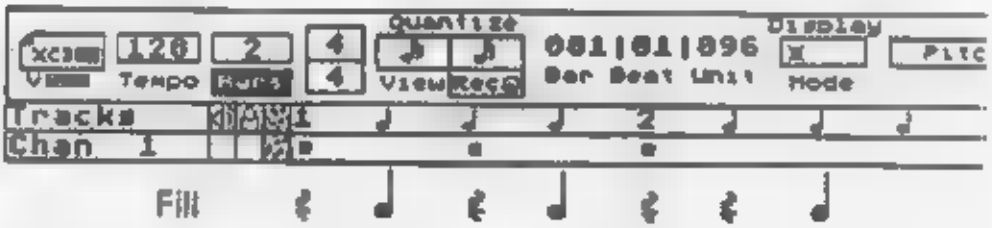
Fill Placement

The Div Numerical lets you set the number of divisions between each note event in a track. For purposes of this explanation, set the Div Numerical to 2.

Paint or play in a single drum track in a section, the simpler the better for purpose of this demonstration. Try something like this:

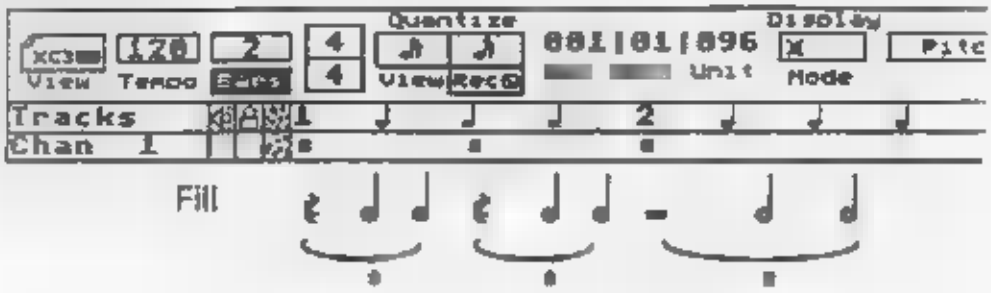


Now enable Fills for this track. You should begin to hear new notes being played directly between the strikes in these locations.



Next go to the Fills View and change the Div Numerical from 2 to 3.

You'll now get Fills placed something like this:



Rests

The Div Numerical sets the value by which spaces between notes are divided for Filling. This is an absolute value, meaning that no matter how close or far apart notes are placed, the rhythmic space between them will be divided by the value in the Div Numerical. If the Div Numerical is set to 4, for example, and if notes are a quarter-note apart, Fill notes will be sixteenth notes. If notes are a whole note apart, Fills will be quarter notes.

You might encounter a rhythmic situation where the Div Numerical causes Fills to occur where you don't want them to occur. You might, for example, have a note on beat 1 and another on beat 4. With the Div Numerical set to 4, this might produce some spooky Fills. You can, however, insert Rests so that the Fills fall where you want them.

Rests are note events that don't sound.

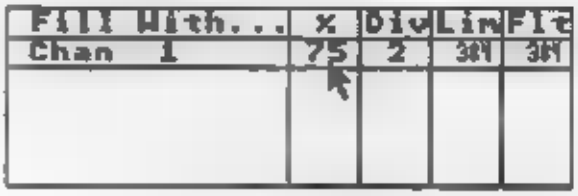
To insert a Rest, select the Main View of the Section window. Then choose the Rest icon from the Section Toolbox.

The cursor will become the Loop Tool, but don't worry about it. Thinking of as the Rest Tool, place a Rest in a track's event area wherever you want one. The Fills feature will think of it as a note event and behave accordingly.

Fill Density

If you're listening to a track where the Fills don't necessarily happen all the time, chances are that Fill Density is set at less than [redacted]

This means that there is a less than [redacted] chance that a Fill event will occur at each of these locations. At 100% they always occur. At 0% they never occur. Change the % Numerical, in the Fills View, and listen to the results.



Fill Sounds

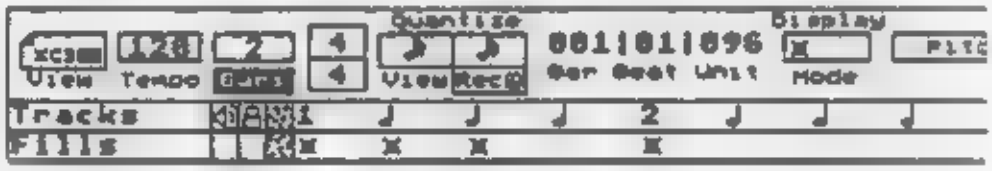
You don't have to use the sound of the track for Fills.

To select a sound for your Fills, change the Fill With... Numerical to the name of the track whose sounds you want to use as Fills.

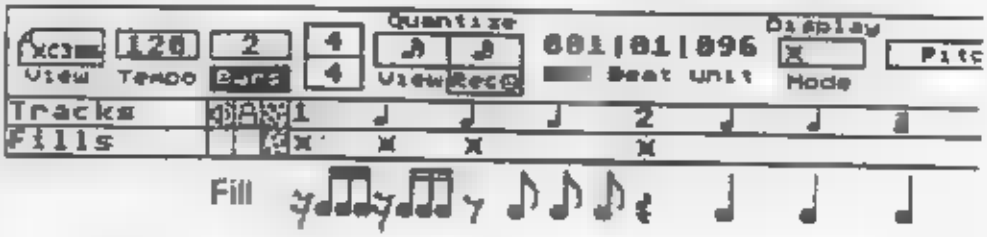
Fill Filters

To avoid the undesirable placement of Fills, you can set the Fill Filter to limit Fills to occur within certain boundaries. The Fill Filter consists of three Numericals: The Lim Numerical, the Fit Numerical, and the + / - Numerical.

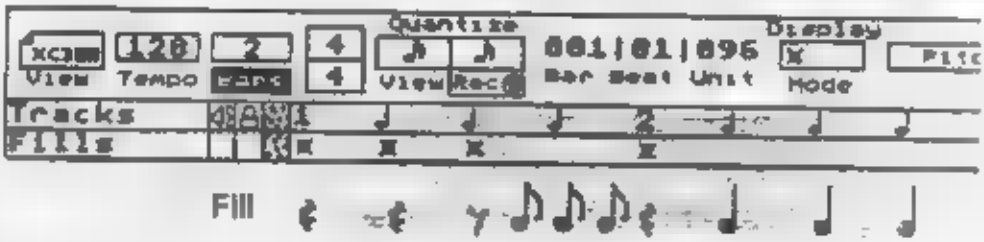
The Lim Numerical sets the smallest rhythmic value for Fills. If the rhythmic value between two Fill notes is less than the limit value, the Fills will not occur. Set up the following track with a Div Numerical value of 8 and a Fill Density of 100%



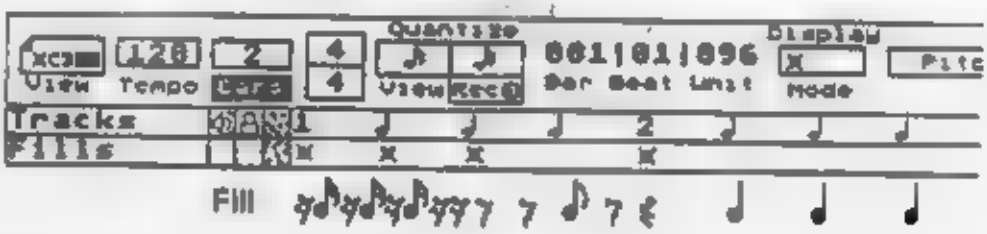
If the Lim Numerical is set [redacted] a 16th note or smaller, you'll hear the following...



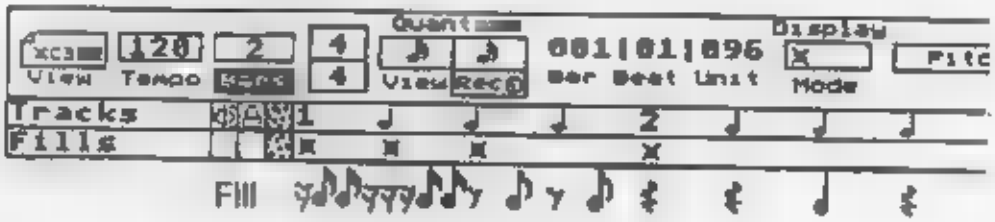
If the Lim Numerical is set at an eighth note or smaller, you'll hear the following...



The Fit Numerical and the + / - Numerical set allowable places for the Fills to occur. A Fit Numerical value of a quarter note means that Fill notes that do *not* [redacted] on [redacted] quarter note will not be played. The + / - Numerical works wi[redacted] Fit Numerical to create a range within which [redacted] will be played. A + / - Numerical setting of [redacted] 16th note with a Fit Numerical setting of a quarter note [redacted] that Fills falling directly on or within a sixteenth note of a quarter [redacted] will be played. All other Fill notes will not play.



A Flt Numerical value of a half note and a + / - Numerical value of a eighth note will allow the following:



Transposition

To transpose Fills, change the Trn Numerical, in the Fills View, to a value in semitones above (positive values) or below (negative values) its current value.

How Fills Relate to Your Music

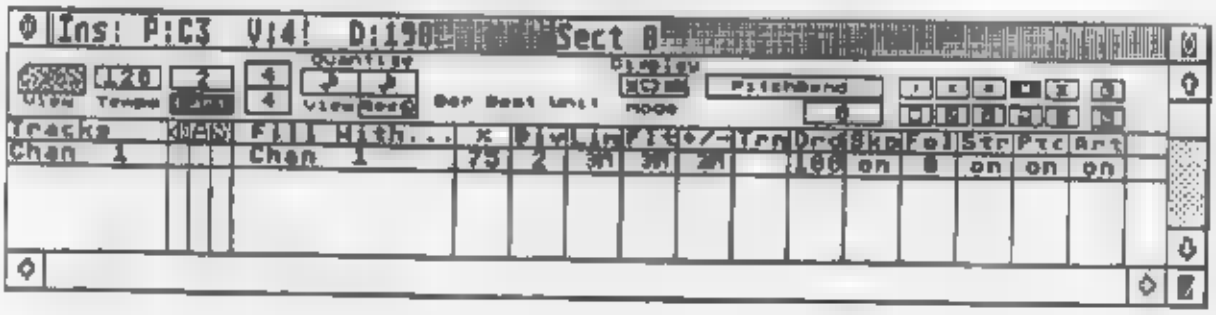
The pitches, velocities, and articulations of Fills can be chosen in two different ways. Pitches, velocities, and articulations can be chosen from the note events played by the track which is selected in the Fill With... column. Or pitches can be chosen from the Track Definition of the track which is selected in the Fill With... column, and velocities and articulations chosen from the Palettes of the track that's being filled.

Fill Following

The method by which pitches, velocities, and articulations are chosen from the note [redacted] in the Fill With... track, is [redacted] Fill Following. Fill Following is a simple way of having Fills follow aspects of what your music is actually playing.

Fill Following consists of four parameters: Follow Distance, Velocity follow, Pitch follow, and Articulation follow. These are set by the Fol Numerical, and the Str, Ptc and Art buttons.

To enable Fill Following, open the Fill View of the Section window.



Then set the Fol Numerical to a value other than zero. To disable Fill Following, set the Fol Numerical to zero.

To set the distance for Fill Following, set the Fol Numerical. In most cases, you'll probably want to set it to a relatively small number so that as RealTime chooses the events it looks at for "inspiration," it will look at fairly recent ones.

When the Str button is set to on, Fill velocities follow the velocities of the note events in the track by the number of events set in the Fol Numerical. When it's blank, Fill velocities are selected randomly from the track's Velocity Palette.

When the Art button is set to on, Fill articulations follow the articulations of the note events in the track by the number of events set in the Fol Numerical. When it's blank, Fill articulations are selected randomly from the track's Articulation Palette.

When the Ptc button is set to on, Fill pitches follow the pitches or Steps of the note events in the track by the number of events set in the Fol Numerical.

When the Ptc button is blank, or when Fill Following is disabled, pitches are selected randomly from the Fill With... track's Track Definition. Fills choose pitches from Track Definitions in the order in which the pitches appear in the Track Definiton. You can, of course, add pitches to the Track Defintion as the Fills are playing. And you can randomize, either partially or completely, the ordering of the pitches from the Track Definition by setting the Ord Numerical in the Fill View. See "Note Ordering" in this chapter for a discussion of randomizing note orders.

Note: Fill Following is enabled, with a Fol Numerical value of 1, as the default setting for tracks opened as synth tracks. Fill Following is disabled, with a Fol Numerical value of 0, as the default setting for tracks opened as drum tracks.

Synchronizing Pitches

Here's a special situation. When Fills are enabled with Fill Following disabled, and when a track is using its own Track Definition for *both* note event information and Fills, the question might arise as to coordinating the succession of pitches as they occur between note events and Fills. To cause note events and Fills to read successive Steps, as either note events or Fills are played, set the Sync button, in the Pitch View of the Section window, to on.

Skipping Unplayed Notes

Here's another special situation. The Skp button performs a special function when pitches are chosen from Track Definitions *and* when the % Numerical is set to less than 100%. The problem is this. When Steps are skipped, "rests" occur until the next Step is played. But when the next Step is played, which Step will it be? Did the "rest" simply cause a wait before playing the next Step in the sequence, or did it skip the Step which might have been played but wasn't? When the Skp button is set to on, the Step that would have been played is skipped. When the Skp button is blank, the Steps advance only when a note is played.

Make Some Music with Fills

Here's a simple example of what you can actually do with Fill Following.

First, set up a simple drum Section with a snare track and a kick drum track. Make it one measure long. Paint in four note events in the kick track on beats 1, 2, 3, and 4. Paint in steady eighth notes in the snare drum track. Now click in the Fill Enable column for the snare drum track. Open the Fill view. Set the % Numerical to 75 and the Div Numerical to 2 for the snare track. Make sure that the Fol Numerical is set to 0.

Now open a new synth track for one of your synths. Paint in a C major triad on beat 1 and an A# major triad on beat 3. Click on the Fill Enable button for the synth track. Open the Fill view and set the Div Numerical to 4, the Fol Numerical to 3, and disable the Str button and Art button for the synth track. Set the synth to play an electric piano sound.

Now listen to the Section. You'll hear a simple drum part and chord progression with a lot of human-sounding variation. Try changing any of the Fill View parameters for the snare and synth tracks. Transpose the synth fills down an octave, increase the Div Numerical to 8, whatever.

Royalties earned with this tutorial song may be sent directly to us.

9 Synchronization

There'll probably come a time when you'll [redacted] to synchronize your drum machine, or another MIDI device, to RealTime's playback.

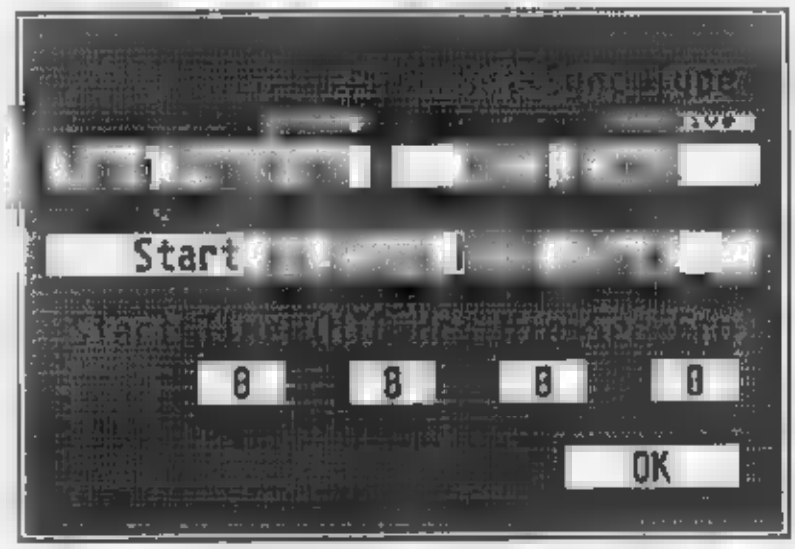
In this chapter, we'll [redacted] you how [redacted] synchronize RealTime to an external device.

Set Sync Type

RealTime can be Master or Slave to another device, which is to say that it can send clock messages to an external device or it can receive clock messages from an external device.

RealTime can send and receive MIDI Clock. RealTime can also receive and echo MIDI Time Code messages, and sync directly to SMPTE through CCL's Phantom™, available from Dr. T's Music Software.

The Sync Type... item in the Timer menu will open the Sync Type dialog.



In the following sections, we'll tell you how to use the controls in this dialog, in the context that each control is used.

Sending MIDI Clock

MIDI Clock is used by most MIDI drum [redacted] and sequencers for synchronization to other devices.

To send MIDI Clock messages to an external device, first make sure that you've connected your Atari's MIDI Out to [redacted] In of your device, then choose Send Clock from the Timer menu.

If Send Clock is enabled, RealTime will send the MIDI Start command when you start playback and the MIDI Stop command when you stop. While RealTime is playing it will send 24 MIDI clock signals per quarter note.

Song Position Pointer

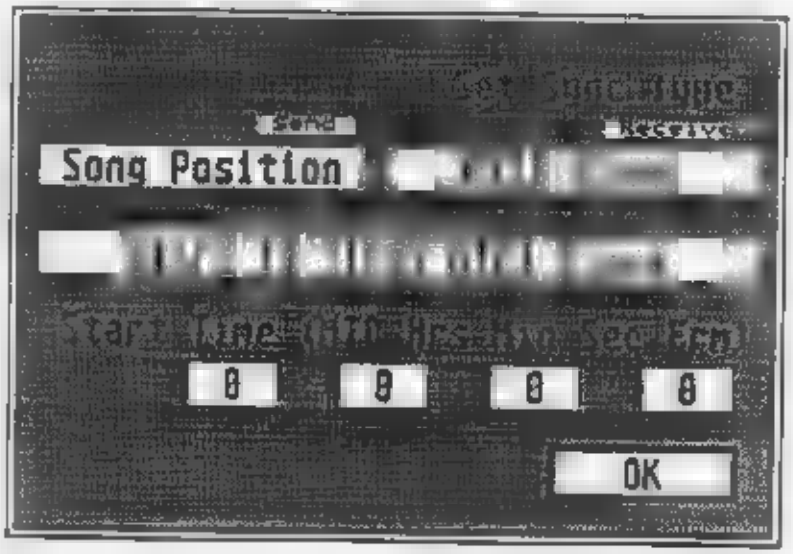
You may also want to send MIDI Song Position messages whenever you continue from Pause or start playback from somewhere other than the beginning of your Song or Section.

To enable the sending of MIDI Song Position messages, choose Sync Type... from the Timer menu. Then enable the Send Song Position button. Then click OK.

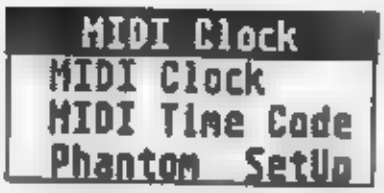
When the Send Song Position button is highlighted, RealTime will [redacted] Song Position messages whenever you start or continue from within a Song or Section.

Setting up to Receive Sync

To set Rea[redacted]me to receive one of the three types of external clocks, choose Sync Type... from the Timer menu. A dialog will appear.



Choose one of the three types of sync code from the Receive pop-down menu.



Once you've selected a sync type, you'll need [redacted] exit the dialog and enable Receive Sync in the Timer menu. This [redacted] allow RealTime to start playing as soon [redacted] it receives the first valid sync signal.

Note: When Receive Sync is enabled, starting playback from within RealTime will disable Receive Sync until you stop playback.

Receiving MIDI Clock

To set RealTime to receive MIDI Clock, choose MIDI Clock from the Receive pop-down menu.

As soon as RealTime receives a MIDI Start command, it will begin playing and continue playing until it receives a corresponding MIDI Stop command.

Since RealTime interprets external timing information while ensuring 768th-note accuracy, the Tempo Numerical may change a bit. Not to worry. This indicates merely that RealTime is adjusting its internal tempo to the incoming signal.

When RealTime is synchronized to an external device and receives a MIDI Song Position pointer, it will jump to the proper bar/beat/unit within the current Section or Song.

Some devices that use MIDI Clock interpret the MIDI Start command as the first MIDI Clock message. When using RealTime with such a device, you'll want to enable the Start is first MIDI Clock button in the Sync Type dialog. This will cause RealTime to interpret the MIDI Start command from an external device as MIDI Start and the first Clock message.

To prevent note information from bogging down RealTime while it's synchronized to an external device, make sure that MIDI Pitch and MIDI Velocity, both in the Options menu, are disabled.

Receiving MIDI Time Code

When MIDI Time Code is selected in the Sync Type dialog, RealTime will synchronize to incoming MIDI Time Code information.

To set RealTime to receive MIDI Time Code, choose Time Code from the Receive pop-down menu.

Then check the MTC start time in the Sync Type dialog. It defaults to zero hours, zero minutes, zero seconds, and zero frames. If you want Realtime to start when the master device starts, leave it set to 00:00:00:00.

Set your SMPTE-to-MTC converter; to send MIDI Time Code messages. When RealTime sees MTC at the Atari's MIDI In port, of a value equal to or greater than the value set in the Sync Type dialog box, RealTime will chase to the indicated location. RealTime will use the specified start time as the location 0011011000.

If the incoming signal corresponds to a position within the current Section or Song, RealTime may take a moment to come up to speed with the tape. For this reason, it's a good idea to start the tape a little before the point to which you want to chase. Once up to speed, RealTime will lock to the MTC signal.

If, for any reason, RealTime loses the MTC signal for more than one quarter note — 192 Ticks — it will assume you have stopped the tape and will stop playing.

Note that RealTime cannot produce an MTC signal but will echo the signal it receives.

A Note on MIDI Time Code and SMPTE

Unfortunately all SMPTE-to-MTC converters are not created equal. RealTime does a certain amount of interpolation to try to keep rolling as smoothly as possible, but if the MTC signal is too sporadic or prone to drop-outs, RealTime may have to stop and rechase to the next position indicated. If you find this happening, or if RealTime falls out of sync, first try stopping the tape and starting again. It is possible that the first message sent was corrupt, or that rounding error has deteriorated the precision of the lock. Restarting at a new location may be exactly what RealTime needs to get back in sync.

It's generally a good idea to use a reference track to make sure that RealTime is accurately locked to the SMPTE-to-MTC converter.

Synchronizing to CCL's Phantom

To set RealTime to receive SMPTE from CCL's Phantom, choose **Phantom** from the Receive pop-down menu in the **Sync Type** dialog.

RealTime will respond to this menu choice only if you have installed the Phantom before running RealTime. Consult your owner's manual if you're not sure that your version of the Phantom will function with RealTime — the manual should mention compatibility with RealTime.

To configure the Phantom, choose **SetUp** from the Receive pop-down menu. A dialog will appear. Use this dialog to access the Phantom's features.

Set up to use the Phantom as you would set up to use MIDI Time Code, except that RealTime will rely on the Phantom for its start time, frame format, and other specific information.

Since the Phantom and RealTime talk directly, and the Phantom does a great deal of error correction on its own, its sync to RealTime is less prone to problems and is more accurate than a system relying on MTC.

It's also generally a good idea to use a reference track to make sure that RealTime is accurately locked to the Phantom.

A Multi-Tasking

RealTime allows you to [redacted] other programs while it continues to run [redacted] a background task. The RealCtrl [redacted] Accessory lets you [redacted] RealTime keyboard equivalents from within another Gem Application.

In this appendix, we'll tell you how to run other programs from within RealTime and how to [redacted] RealTime's commands through the RealCtrl Desk Accessory.

Multi-Tasking With RealTime

To run another program within RealTime, choose **Run Other...** from the Special menu.

RealTime will run the other program as the desktop would. RealTime is not a switcher. Programs are executed as if they were opened from the desktop and quit as normal. This allows RealTime to work with already existing programs without any modifications to them.

Any program that you want to run within RealTime should meet the following requirements. It can not be auto-booting. It must be able to be successfully quit and returned to the Atari desktop. It can not rely on timers. If you want to access the functions of RealTime from the other program, the other program must allow access to desk accessories.

Certain MIDI programs should work within RealTime's shell, such as utility programs which are not timer dependent and use the standard Atari operating system functions. Programs that use more elaborate MIDI schemes may cause hung notes [redacted] inhibit RealTime's MIDI input/output.

Most word-processing and graphics programs fit into the allowable category. You can write lyrics, balance your budget, even design the cover for your next album while you write it.

The RealCtrl Accessory

If you want to control RealTime while running another program, you'll have to call the RealTime Control Desk Accessory from [redacted] GEM program.

When this desk accessory is opened from [redacted] GEM program, keypresses on the Atari's keyboard will act as they would within RealTime rather than as they would [redacted] that program.

B Shortcuts

Here are some mouse actions and keyboard equivalents that will help you to more easily and quickly [redacted] RealTime's functions.

Modified Mouse Actions

Section Window

Control-click within the event area of a track to open the control display for that track and find the first control present on the track. Subsequent Control-clicks will cause the next control to be displayed, then the next, and so on.

Shift-click on a track's name to select a track without deselecting those already selected.

Control-drag a track's name on top of another track to copy the source track's Track Definition into the destination track.

Alt-drag a track's name to a blank location in the Section window's Track Names column to make a copy of the track.

Song and Library Window

Alt-drag to copy an entry to another location.

Shift-click [redacted] entry's name to select an entry without deselecting those already selected.

Drag an entry's name to move the entry to another location.

DeviceWindow

Shift-click on a entry's name [redacted] select the entry without deselecting those already selected.

Shift-click on the window's Device icon to deselect selected entries and select deselected entries.

Key Equivalents

General

Return	Pause/Continue
Space	Play/Stop
Tab	Record on/off
Esc	Clear text in a text field
Alt-I	Input Control System on/off
BackSpace	Erase selected Region
Ctl-A	Save All As...
Ctl-B	Beat Bar on/off
Ctl-C	Copy selected Region
Ctl-D	Open Edit Name dialog
Ctl-E	Erase selected Region
Ctl-G	GoTo (Locate) within Section
Ctl-I	Import MIDI File into Song/Section
Ctl-K	Metronome on/off
Ctl-L	Open/Show Library window
Ctl-M	Save Movie as MIDI File
Ctl-N	Open new Section
Ctl-O	Open selected Song/Section
Ctl-P	Load Section
Ctl-Q	Open Smart Edit dialog
Ctl-R	Remove selected items
Ctl-S	Save All
Ctl-T	Thin selected Region
Ctl-U	Save current Section
Ctl-V	Paste contents of Clipboard
Ctl-X	Cut selected Region
Ctl-Z	Undo Regional edit

Section Window

0—9	Octave/value
(	Random Strike
)	Random articulation
A—G	Select a pitch
Shift A — G	Select an accidental
L	Loop Tool
[redacted]	Program change
? or S	Random Step Note
S#	Step Note
F1 — F5	Select Strike value 1-5
F6 — F10	Select articulation value 1-5
Shift-F1	16th note duration
Shift-F2	Dotted 16th note duration
Shift-F3	Eighth note duration
Shift-F4	Dotted eighth note duration
Shift-F5	Quarter note duration
Shift-F6	Dotted quarter note duration
Shift-F7	Half [redacted] duration
Shift-F8	Dotted half note duration
Shift-F9	Whole note duration
Shift-F10	Dotted whole note duration
Up/dn arrow	Velocity +/-1 (value)
Shft up/down arrow	Velocity +/-10 (value)
Left/right arrow	Duration +/-1
Shift lft/rt [redacted]	Duration +/-view grid resolution

Library Window

A—Z	Start Library entry playing

C MIDI Controls

There's a certain amount of confusion in the MIDI world concerning the difference between MIDI controllers and MIDI controls. To many people, a MIDI controller is a keyboard, MIDI guitar, drum pads, etc., and a MIDI control is something generated by the pitch bend or mod wheel on a synth.

In the MIDI Spec, however, "MIDI controller" refers to a numbered MIDI message which can be used to control many different functions in a MIDI synth.

In an effort to avoid confusion, we refer throughout this manual to numbered MIDI control messages as MIDI controls. In RealTime, we edit MIDI controls using the Controls menu.

About MIDI Controls

MIDI controls are divided into two types — continuous controls and switch controls.

Continuous controls cover a range of values, typically from 0 to 127. They are used in a MIDI synth to control functions that change in small steps, such as volume or modulation amount. Pitch bend is a special case, in that it has a much higher resolution than the other continuous controls, which is necessary for smooth pitch changes. Pitch bend control values range from -8192 to +8192.

Switch controls simply switch functions in a MIDI synth, such as sustain and data increment, on and off. With switch controls, any value above 64 registers as On, and any value below 64 registers as Off.

Most MIDI synths respond to some of these controls, but very few respond to all. In some synths, the control messages are permanently routed to a certain function — for example, Control #7 always controls a synth's volume. Other synths need to be set to receive MIDI controls and to assign them to specific functions. Check your synth's manual and particularly its MIDI implementation chart, which should tell what controls can be recognized.

A Chart of [redacted] Controls

MIDI Control	Number
Mod wheel	1
Breath controller	2
Old DX-7 aftertouch	3
Foot controller	4
Portamento time	5
Data entry MSB	6
Main volume	7
Balance	8
Pan	10
Expression	11
General purpose 1-4	12-15
Roger Linn	20
Sustain pedal	64
Portamento	65
Sostenuto	66
Soft pedal	67
Hold 2	69
General purpose 5-8	80-83
Data increment	96
Data decrement	97
Non-registered parameter number LSB	98
Non-registered parameter number MSB	99
Registered parameter number LSB	100
Registered parameter number MSB	101

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Jumping Right In

In this introductory tutorial, we're going [redacted] give you [redacted] overview of RealTime. We're going [redacted] jump right in and get you started, quickly and easily.

We assume that you know how [redacted] use your Atari and that your MIDI system [redacted] set up. If you don't, and if it isn't, read Chapter 1 of the manual and then come back.

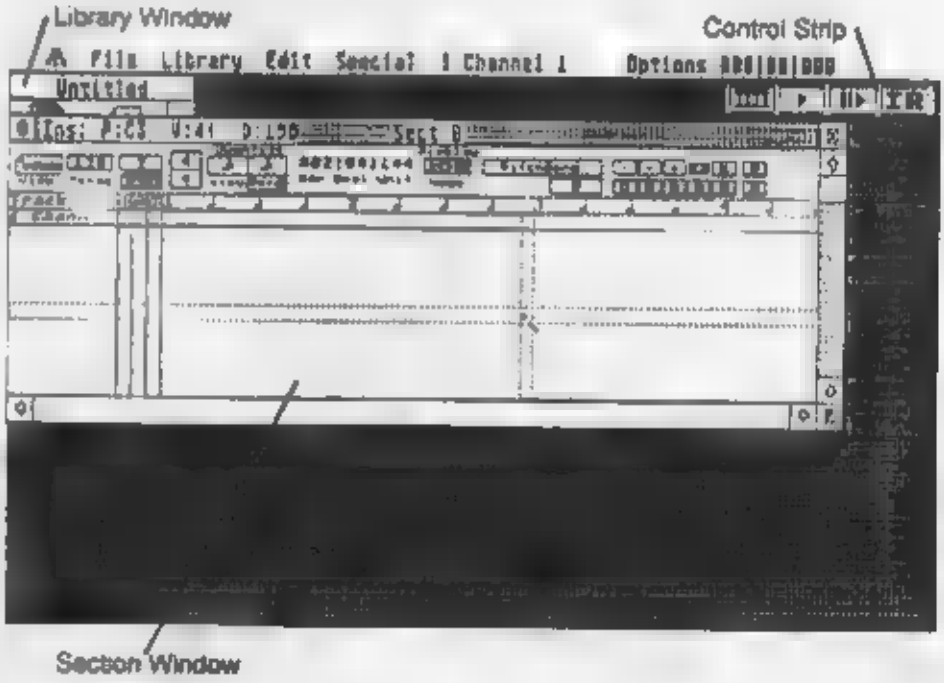
As you go through this tutorial, bear [redacted] mind that RealTime has a Help feature. Whenever you want [redacted] know what a specific control does, press the Help key on your Atari's keyboard and then click on the item [redacted] question.

Run the program

Start the program by clicking on the program icon. When the program opens, you'll see a dialog box asking you to [redacted] the first section of music.

Press the Esc key to clear the text, type in whatever [redacted] you like, and click OK or press the Return key.

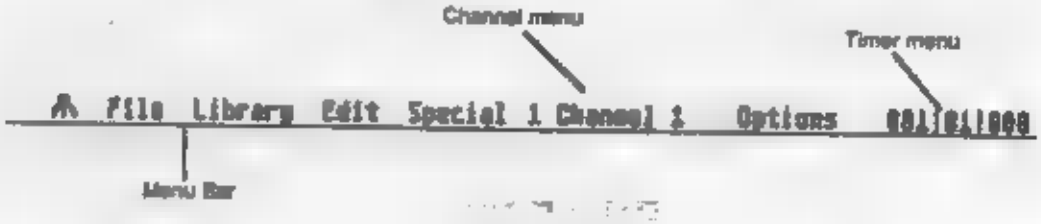
You'll [redacted] two windows and the Control Strip.



The Record and Play buttons are in the Control Strip. The notes you record, as well as other musical information, will [redacted] shown in the Section window. We'll discuss the Library window, currently labelled Untitled, later.

Before Recording

There are a few things you should do before you start recording. For one, choose the MIDI channel to which you want to record. Go to the Channel menu and choose the channel number that corresponds to the receive channel of your synthesizer.



The channel to which you're recording will appear in the Menu Bar as the current title for the Channel menu.

Then, give a thought to quantization.

Record Quantization

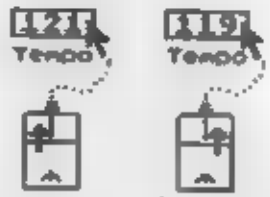
Record quantization is enabled or disabled by toggling **Quantize Input** in the Options menu. When it's enabled, a checkmark will appear, and what you play will be quantized to the value set in the Rec Numerical, under **Quantize**, left of center at the top of the Section window.

The Rec Numerical is presently set to 16th notes. Change the Rec Numerical to, for example, 32nd notes...

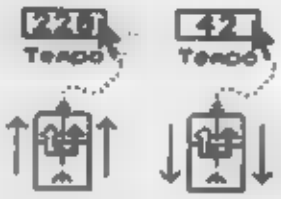
But wait a minute! Maybe you don't yet know how to use Numericals. Read on.

Using Numericals

One of RealTime's primary screen controls is the **Numerical**. A Numerical is a box containing numbers, words, or graphic images that you can change directly on the screen. The Tempo control in the Section window, for example, is a Numerical. Click on the number with the left mouse button and its value will increase. Click with the right button and its value will decrease.



You can also scroll through Numerical values by holding down either mouse button and moving the mouse up (for higher values) or down (for lower values).



Now go back and click twice *with the right mouse button* on the Rec Numerical. After the first click, you'll see 16th note triplets. After the second click, you'll see 32nd notes. If you leave the Rec Numerical set to 32nd notes, everything you record will be quantized to 32nd notes. But if you prefer, set the Rec Numerical back to 16th notes by clicking on it twice with the left mouse button.

Or, you can disable quantization altogether. Click on **Quantize Input** in the Options menu, so that the checkmark disappears. To reenable quantization, click on **Quantize Input** again, so that the checkmark reappears.

Recording and Playing

Now we're all set. Enable MIDI Record by clicking on the Record button (IR) in the Control Strip. Then click the Play button (>), or press your Atari's Spacebar.

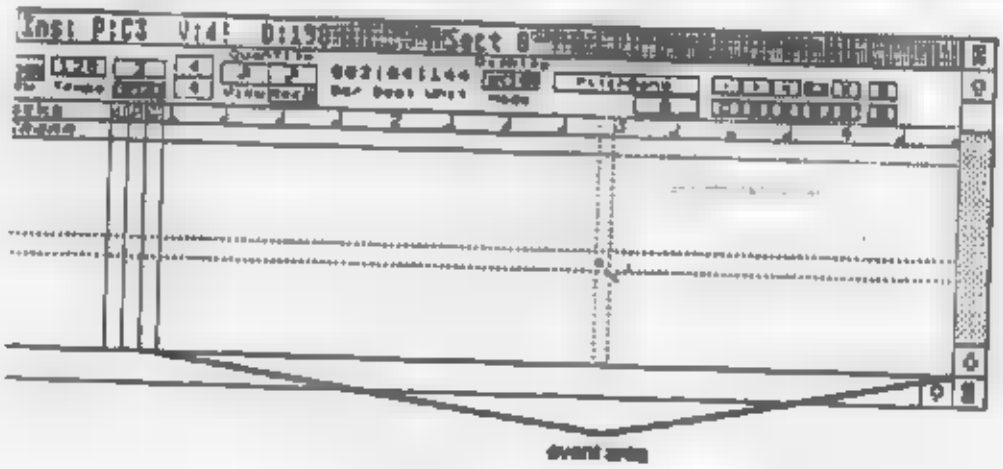
The Timers menu title will read **Waiting**. If the volume isn't up on your Atari monitor, turn it up so that you hear a metronome. RealTime is waiting for you play the first note before it starts recording.

When you play, RealTime will automatically open a track in the Section window and your music will appear as symbols in the track's note display area. You'll see Strike Symbols placed where the notes begin. You'll also see letters and numbers representing pitches, and gray bars representing durations.

Now play a two-bar phrase, listening to the metronome. Note that the startup state is two bars in 4/4.

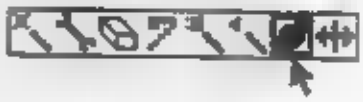
Notice that your two-bar phrase is looping. Continue to record, adding notes, and notice that what you play is overdubbed in the same two bars. Loop recording lets you build a part as you hear it grow.

If you got it wrong and you want to start again, do the following. Move the cursor into the Event area of the Section window.



Click with the right mouse button. The Section Toolbox will appear.

Move the cursor to the Selector. Click with the left mouse button and the cursor will become the Selector.



Then move the Selector [redacted] the track's note display [redacted] and double-click. The entire track will be selected. Press the Backspace key on your Atari's keyboard. You've deleted all events from the track.

Then record again.

When [redacted] Recording is Done

When you've got what you want, type Control-K to turn off the metronome.

To stop the music, click on the Play button. Or press the Spacebar. Click on the Record button to disable MIDI Record.

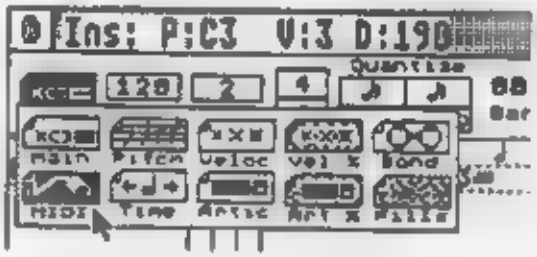
To start again, click again on the Play button. Or press the Spacebar.

Note: If you want to listen to your music, and if the Record button is enabled, you may have to click a second time on the Play button, or press the Spacebar a second time, to initiate playback. This is a normal function of RealTime's Record Waiting feature, which causes RealTime to wait for [redacted] input before starting a recording. To disable Record Waiting, click on Record Waiting in the Options menu, so that the checkmark disappears. To reenable it, click again on Record Waiting in the Options menu, so that the checkmark reappears.

Selecting Sounds

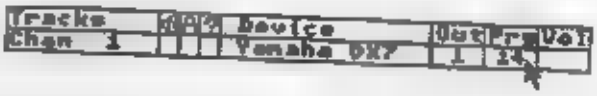
Are you happy with the sounds you're hearing? If not, you can send a program change [redacted] your synthesizer.

Look in the upper left corner of the Section window. You'll [redacted] a button labelled View. Click [redacted] it. The View pop-down menu will pop down. Move the cursor over the button labelled MIDI. Click [redacted] it.



You'll [redacted] the MIDI View of the Section window.

Set the Prg Numerical to whatever program number you'd like.



Note: When a Numerical is blank, it's disabled. No value is sent or registered. Blankness is equivalent to a Numerical's "zero" position.

Change Channels

And while you're at it, is your track being sent to the right synthesizer? Perhaps you need to change MIDI channels.

While still in the MIDI View, set the Out Numerical to the number of the MIDI channel on which you want the track to be played.

Set a Volume

Is your track loud enough? Too loud?

Still in the MIDI View, change the Vol Numerical's value to a volume level you'd like. You can change its level to anywhere between 0 (which is silence) and 127 (which is pretty loud).

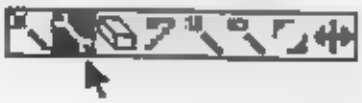
Simple Editing

It could be that your track contains a few minor mistakes. Well, to err is human, and mistakes are easy to deal with.

Click on the View button again to open the View pop-down menu. Select Main.

You'll see the Main View of the Section window.

Open the Section Toolbox. This [redacted] select the Monkeywrench.



The mouse cursor [redacted] become the Monkeywrench. With it, you can change a note's pitch, velocity, and duration.

Change a Note's Pitch

To change a note's pitch, do [redacted] following. Place the tip of the Monkeywrench on the Strike Symbol (· ▪ ✱ ■ ✖) of any note whose pitch you want to change. Then hold down the Shift key on your Atari's keyboard and press the left mouse button. Move the mouse up or down for higher or lower pitches. The changing pitches are shown in the Event Information Line, in the left corner of the title bar of the Section window, next [redacted] P: .

Once you find the right pitch, release the Shift key, release the mouse button, move the mouse slightly, and the new pitch representation will appear in place.

Change [redacted] Note's Velocity

To change a note's velocity, [redacted] the following. Place the tip of the Monkeywrench on the Strike Symbol of any note whose velocity you want to change. Then press the left mouse button and move the mouse up or down for higher or lower velocities. The changing velocities [redacted] shown in the Event Information Line, next to V: .

Release the mouse button, and [redacted] the mouse slightly. The Strike Symbol might have changed shape, depending upon the extent to which you've changed the note's velocity. Strike Symbols come in five different shapes.

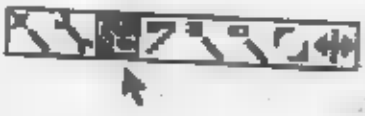
Change a Note's Duration

To change a note's duration, do the following. Place the tip of the Monkeywrench on the Strike Symbol of any note whose duration you want to change. Then press the left mouse button and move the mouse left or right for shorter or longer durations. The changing durations are shown as Ticks (a Tick is 1/192nd of a quarter note) in the Event Information Line, next to D:

If you make a note's duration long enough to overlap with another note, the track will open up to accommodate the longer gray bar.

Clearing Single Notes

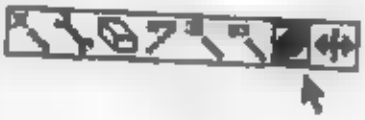
Open the Section Toolbox. Select the Eraser.



To erase a note, click on the Strike symbol of the note to be erased.

Clearing Groups of Notes

Open the Section Toolbox. Choose the Selector again.



Then, in the track's note display area, click at the left edge of the Region you wish to clear and drag to the right to select the Region.

When you've selected the Region you want to clear, choose **Erase Region** from the Edit menu, or type **Control-E** or **Backspace**.

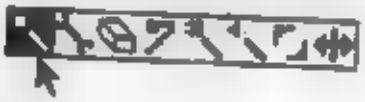
Removing an Entire Track

If you want to remove an entire track, select the track by clicking on its name in the Track Name column. Then choose **Remove Track(s)** from the Edit menu, or type **Control-R**.

Painting Notes

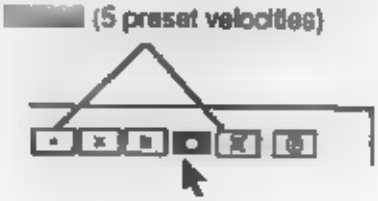
You don't need to record through MIDI to enter notes into a track. It's not exactly visual art, but you can paint notes. Painting notes gives you great rhythmic precision.

Select the Striker from the Section Toolbox.



Then choose a pitch by typing on your Atari's keyboard. Type a lowercase c and then 3 to select C3, for example. If you want C#3, type an uppercase C (Shift-C), then 3. Accidentals are always represented as sharps.

Choose a velocity value for the Strike Symbol by clicking in one of the boxes in the Velocity Palette, in the upper-right corner of the Section window.



Choose an articulation (legato — staccato) value by clicking in one of the boxes in the Articulation Palette, directly below the velocity boxes.

Then place your note by clicking at the appropriate place in a track's note display

View Quantization

While placing notes, you'll have noticed that an Edit grid follows the mouse.

View Quantization lets you adjust the graphic resolution of the note display area by changing the number of steps the mouse can move between quarter notes. If the View Numerical is set to 16th notes, as it is now, you can move the mouse in four steps between quarter notes.

Click twice *with the right* *button* to change the View Numerical to, for example, 32nd notes...

...and you'll be able to place and edit Strike Symbols within eight steps between quarter notes.

Looking at the Screen

If you've set the View Quantization to 32nd notes, it could be that the Event area will extend beyond the screen. There are several things you can do.

You scroll, using the scroll bar at the bottom of the Section window.

You can enable automatic scrolling during playback. Choose Scrolling from the Timer menu.

And, of course, you can change the View Quantization Numerical back to 16th notes.

Point Record

There's yet another way to record notes. It's called Point Record.

Point Record allows you to enter pitches and chords by positioning the mouse in a track's note display area, wherever you want the note to be, and then playing notes or chords on your keyboard.

To do it, choose Point Record from the Options menu. Then choose MIDI Pitch from the Options menu (if it's not already selected). If you want to record velocities at the same time, choose MIDI Velocity from the Options menu.

If Play is enabled, click on the Record button in the Control Strip to disable MIDI Record.

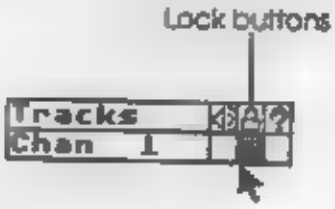
Then place the mouse cursor at the point where you want to insert an event, and play your MIDI board.

Record New Track with Pitch Bend

Well, you've recorded into one track using a variety of recording techniques. Now we'll record into a new track, using pitch bend.

If you've got more than one synthesizer, go to the Channel menu and select a channel that corresponds to the receive channel of your second synthesizer.

But suppose you have only one synthesizer. Leave the Channel menu set for the same channel as the first track. And lock the first track, by clicking on its Lock button.



Locking a track keeps it from accepting any new information. In this case, it will let you record into another track without affecting the already-recorded track.

Then click the Record button to enable MIDI Record. Then click the Play button, if it's not already enabled. If you want hear metronome, type Control-K.

Play a new two-bar phrase, using your pitch bend wheel. A new track will open up as you begin to play.

Mute

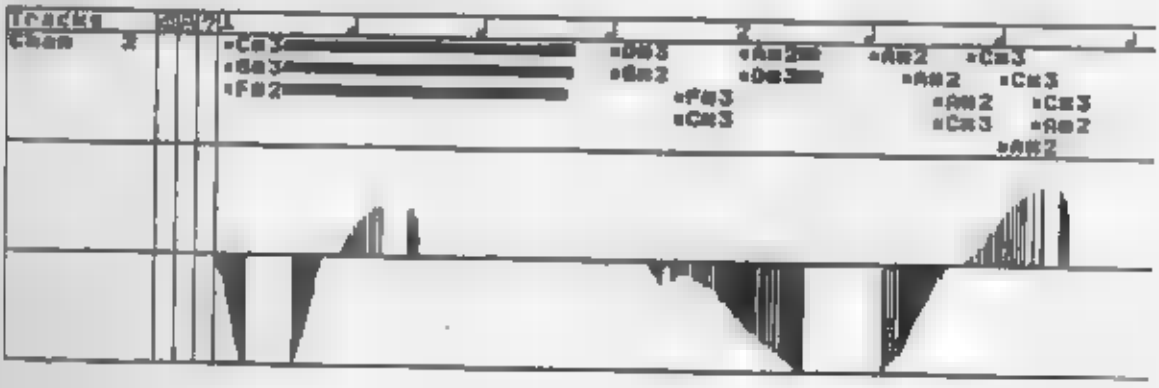
Can you hear what you're doing? Perhaps you want to mute the first track, that you're listening only to the track you're working on.

Click on the Mute button for the first track, directly to the right of the track name.

Edit Pitch Bend

Uh-oh. The pitch bend wasn't quite right. Hmmm. No problem.

Control-click in the note display area of the track you've just recorded. Your pitch bend performance will displayed.



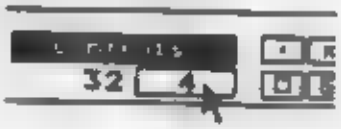
Select the Striker from Section Toolbox and edit the pitch bend by drawing with the mouse. You'll get the idea when you try it.

To clear something you've drawn, use the Selector to select a Region, then press the Backspace key on your Atari's keyboard.

Editing Controls

You display and edit aftertouch, all MIDI controls and switches, and even Tempo Maps, in the same way you've just edited pitch bend. Choose whatever you want to edit from the Controls pop-down menu in the Section window.

If you want to edit a control number, specify the number with the Control Numerical. MIDI control #7, for example, is volume. Set the Control Numerical to #7 and draw a volume shape, using the Striker from the Section Toolbox.



When you've finished experimenting with controls, and you want to return to the all-tracks view of the Section window, select **Display** from the Control pop-down menu.

Devices

We think you'll like RealTime's Devices feature because it's going to solve many problems which you may be having.

Here's one problem it's going to solve. In drum machines, each sound responds to a different pitch, and the sound-pitch relationships vary from drum machine to drum machine. With a normal sequencer, you'd have to play the pitches in as you begin every session.

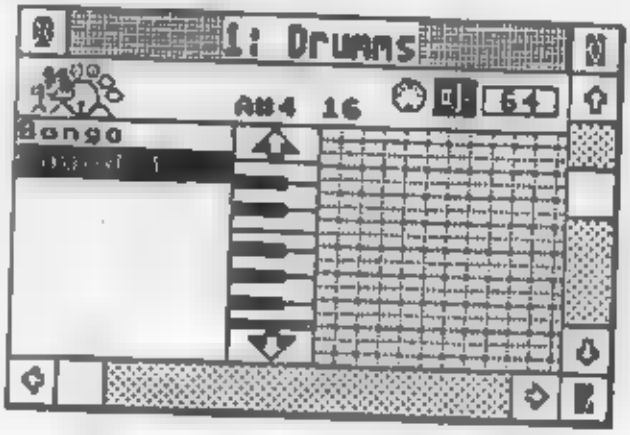
Here's our solution. RealTime's Devices feature remembers the sound-pitch relationships of your drum machine, so that you can begin a session with the sounds in place. RealTime also lets you separate the sounds onto different tracks, so that you can choose the sounds you want to use and paint rhythms.

There's a lot more you ■ do with the Devices feature, but we'll start with drum machines.

Setting Up ■ Drum Machine Device

Choose the Open item from the Channel menu that's next to the MIDI channel number which corresponds to the receive channel of your drum machine.

A Device window will open.



Click *with the right mouse button* on the icon in the upper left-hand corner of the Device window. A dialog will appear. Press the Esc key on your Atari's keyboard, to clear the te Then type in the name of your drum machine. Then click ■ Drums.

With the Device window still open, type in the name of the first sound on your drum machine. The name will appear in the first line of Track Definition names.

Then find the pitch which corresponds to the sound. Use your MIDI keyboard or, if your drum machine generates MIDI, just play the sound on the appropriate pad. When you've recorded the correct pitch, type Return. Your Track Definition will be registered and a new Track Definition will open up.

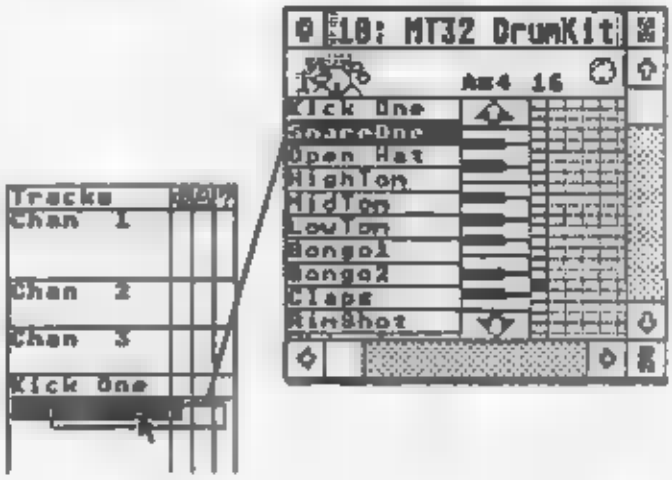
Repeat the process for all of the sounds in your drum machine.

When you've finished defining all the tracks in your Device, you'll want to save it as part of RealTime's startup ■ that all the sounds will be immediately available to you at the beginning of each session. Save the Device List by choosing **Save Device List As...** from the File menu. Type Return.

Using Your Drum Machine Device

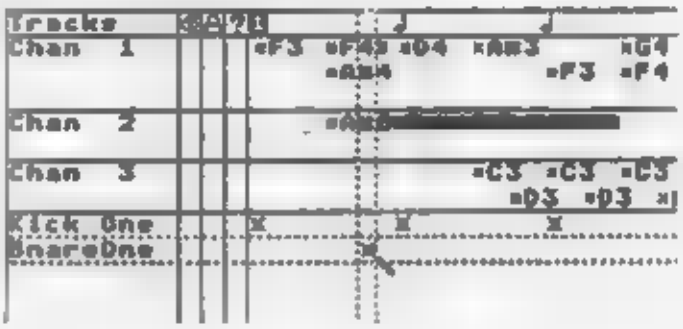
Now you'll want to make music with [redacted] tracks you've just defined. So...

With the Device window still open, drag the Track Definitions you want from the Device window into the Track Names column of the Section window, below the track names that [redacted] already there.



When you've got the Track Definition in place in the Section window, close the Device window.

Then, using the Striker from the Section Toolbox, paint Strike Symbols within a track's note display area. Just for the sake of clarity, paint a basic rhythm pulse, with Strike Symbols placed at every quarter note. Do it while the track is playing back, so that you can hea[redacted]s well as see, what you're doing. Note that you don't need to have MIDI Record enabled in order to paint Strike Symbols.

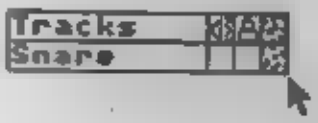


Fills

RealTime's Fills feature is something special. It will let you determine the way in which RealTime will generate automatic fill beats in between the beats you've painted or played.

Mute all of the tracks except for the one with Strike Symbols at every quarter note.

Then click on the Fill button associated with that track.



You'll hear some extra notes playing in between the notes you painted. Don't worry. It's supposed to happen. And now, we're going to play with those extra notes.

Choose Fills from the View pop-down menu.

You'll see the Fills View of the Section window.

Change th Div Numerical to 3, then 4, then 5, 6, etc.

Hear what's going on? Lots of extra notes. Some notes will be missing, however, because the % Numerical is set to 75%. That means that only 75% of the fills will be played. Change the % Numerical to 100%. Then change it to 20%. You'll get the idea. Play with the Div Numerical and the % Numerical until you get something you like.

But is your track filling with the right sound?

If not, change the Fill With... Numerical so that the fill beats use the sounds of another track.

Track Bondage

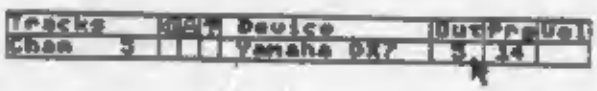
Here's another special feature. Use Track Bondage for rhythmic emphasis, orchestration, layering voices, and lots of other things.

Click below the names of the already-existing tracks, to open a new track.

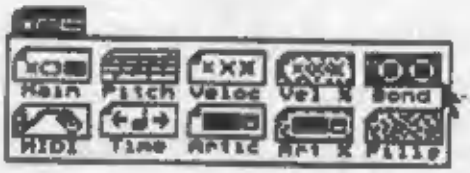
Choose MIDI from the View pop-down menu.

You'll see the MIDI View of the Sections window.

Then, change the Out Numerical to a MIDI channel that corresponds to the receive channel of another synthesizer. If you're running out of synthesizers, set it to the receive channel of one of your synthesizers.



Then select Bond from the View pop-down menu.

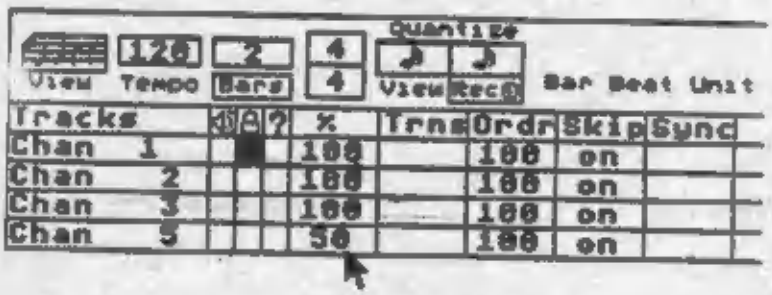


You'll see the Bondage View of the Section window. Change the Master Numerical until you see the name of an already-recorded track.

Click on the Play button if your music's not already playing. Mute all tracks except for the Master track and the new track. You should now hear the Master track's part played on the new track as well as on the Master track. You've bonded the tracks together.

Now try this. Select Pitch from the View pop-down menu, so that you're seeing the Pitch View of the Section window.

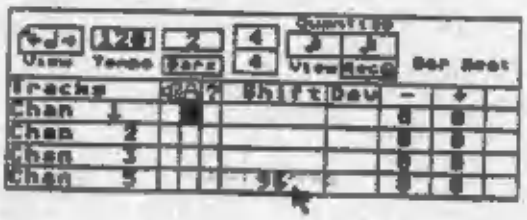
Change the % Numerical to 50 for the track you've just bonded.



You'll hear the bonded track punctuating the original track 50% of the time.

Then select Time from the View pop-down menu, so that you're seeing the Time View of the Section window.

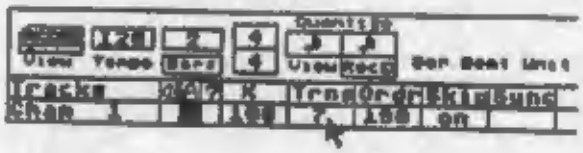
Set the Shift Numerical to 96.



You should now hear the bonded track offset by a quarter note.

Now try this. Select Pitch from the View pop-down menu.

You're again seeing the Pitch View of the Section window. Change the Trns Numerical up or down. You'll be transposing the new track by semitones. Change the Trns Numerical to 12, to transpose the new track up an octave.



Using the Library Window

Now we're going to point the way towards putting together an entire composition.

Close the current Section window.

Notice that the Section name is stored in the Library window. The purpose of the Library window is to provide a list of all Sections and Songs created in a RealTime workspace, so that you can use them in different combinations to create entire compositions.

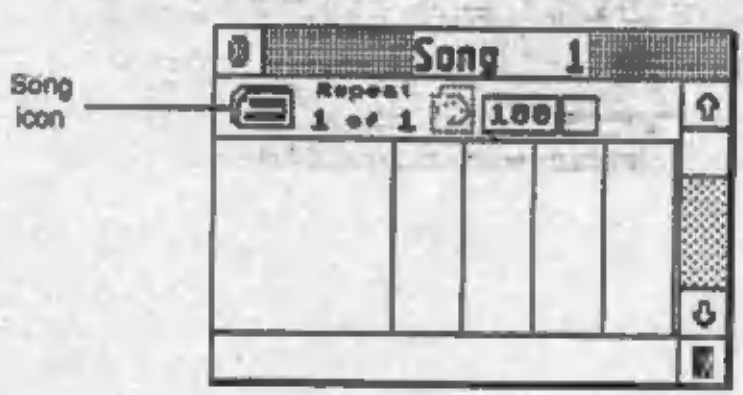
Now create a new Section, just for the sake of this tutorial. Choose New Section from the Library menu. When the Section Name dialog appears, name the second Section. Record a track or two.

When you're finished, close the second Section window. It too will be listed in the Library window.

Songs

Now we'll create a Song from the Sections you've created. A Song is an entire composition — a chain of Sections and/or other Songs that are played sequentially.

Choose New Song from the Library menu. A Song window will appear.



Name the Song window. Click with the right mouse button on the Song icon. The Song Name dialog will appear. Press the Esc key to clear the text, then type in the name of your Song. Then press the Return key. Notice that the Song's name is also stored in the Library window, for use in other Songs.